R. PETERSEN

FEDERAL EMERGENCY MANAGEMENT AGENCY

April 1987

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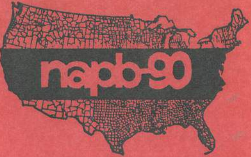
Nuclear Attack Planning Base-1990 Final Project Report

Part 1 Project Overview
Part 2 Project Development
Part 3 Risk Definitions



NUCLEAR ATTACK PLANNING BASE - 1990

EXECUTIVE SUMMARY

PROJECT OVERVIEW

The NAPB-90 project was an in-house project of the Federal Emergency Management Agency (FEMA) carried out over a year and a half from early 1985 to 1986. The project was coordinated by the Office of Emergency Management Programs, State and Local Programs and Support Directorate, and involved professionals and experts from FEMA directorates and offices, other Federal departments and agencies, and the private sector.

The NAPB-90 is an estimate of the potential physical effects of a nuclear attack on the population of the United States in terms of the degree of the potential risk.

Three types of potential nuclear attack effects risks and the areas and populations affected by each are defined:

- The direct effects risk from blast overpressure generated by the explosion of a nuclear weapon;
- The potential thermal and secondary blast-ignited fire risk created by the combined effects of blast overpressure damage and the thermal pulse or fireball of a weapon; and
- The fallout risk from radiation generated by surface-burst weapons.

The development of the planning base followed detailed studies of all aspects of nuclear attack planning, but despite such efforts specific confidence limits cannot be assigned to either implicit or explicit assumptions used regarding targeting, weapon yields and designs, heights of burst, and delivery system accuracy and reliability. In short, NAPB-90 does not (and cannot) claim total realism.

PROJECT DEVELOPMENT

An initial study of Soviet military objectives, war-fighting scenarios, targeting strategies, and force applications provided the basis for many of the developmental procedures and policies of NAPB-90. In the development of the target base, for example, close attention was paid to frequent Soviet references to damage limitation strategies, particularly those involving non-target resources of the enemy. This element significantly influenced procedures used in making final possible enemy target selections.

NAPB-90 is a scenario-independent study since Soviet targeting priorities (as well as their strategic objectives) remain essentially the same regardless of the *a priori* scenario under which their weapons would be employed.

All of the NAPB-90 targets were developed and carefully edited to conform to both Soviet-declared strategic objectives and force deployment principles. Initial and subsequent iterations of the target base were compared against listings of projected 1990 Soviet strategic nuclear forces in order to assure logical weapon employments. All aim points finally selected were attacked using Soviet strategic targeting procedures to assure realistic weapon employment. In this respect, the following targeting factors were used in weapon selection and employment:

- The height of weapon detonation representing the height which would be selected by the Soviet strategic planner for weapon detonation;
- The Soviet views regarding expected surface characteristics of selected U.S. targets which would influence the extent of blast overpressures generated;
- The vulnerability of U.S. targets to blast overpressures assumed by the Soviet planner; and
- The probability of damage or destruction of the target influenced by the accuracy of the Soviet weapon and its probability of arrival on target.

In short, all Soviet weapons were employed as if by a Soviet strategic planner. Thus, NAPB-90 is not a "mirror-image" attack in which weapons and targets are chosen from a U.S. point of view.

RISK DEFINITIONS

Direct Effects - NAPB-90 defined the potential risk from nuclear weapon blast overpressures as the total area affected by 0.5 pound per square inch (psi) or more. This represents 727,112 square miles of the U.S. with an estimated resident population of 175.1 millions. Since NAPB-90 does not target population *per se*, the persons affected by blast overpressures reside in areas which are peripheral to or collocated with potential military and industrial targets.

Four degrees of the potential risk from blast overpressure were delineated, based on the severity of short-term threat from the blast wave itself and its potential to kill or injure; the potential long-term severity to survivors within the blast area; and the kind, degree and practicality of in-place and/or crisis-general measures necessary for protection.

- Very High Direct Effects Risk Areas were defined as areas surrounding target aim points which have the potential to experience blast overpressures equal to or greater than 10.0 psi from a nuclear detonation(s). Approximately 47.2 million persons (19 percent of the population) reside in Very High Direct Effects Risk Areas which cover approximately 46,352 square miles.
- High Direct Effects Risk Areas were defined as areas around a target aim point which have the potential to experience blast overpressures from a nuclear weapon detonation of equal to or greater than 5.0 psi

but less than 10.0 psi. Approximately 32.2 million persons (13 percent of the population) reside in High Direct Effects Risk Areas which cover approximately 49,896 square miles.

- Medium Direct Effects Risk Areas were defined as areas around target aim point which have the potential to experience blast overpressures from a nuclear weapon detonation(s) of equal to or greater than 2.0 psi but less than 5.0 psi. Approximately 50.3 million persons (21 percent of the population) reside in Medium Direct Effects Risk Areas which cover approximately 151,535 square miles.

- Low Direct Effects Risk Areas were defined as areas around target aim point which have the potential to experience blast overpressures from a nuclear weapon detonation(s) of equal to or greater than 0.5 psi but less than 2.0 psi. Approximately 45.4 million persons (19 percent of the population) reside in Low Direct Effects Risk Areas which cover approximately 479,329 square miles.

In sum, approximately 72 percent of the U.S. population is potentially affected by blast overpressures 0.5 psi or more, with 67 million persons living outside the total area defined as at direct effects risk.

Fallout Risk - The potential risk from fallout radiation generated by ground-burst weapons is vast and far-reaching. NAPB-90 defined the entire continental U.S. as under this potential risk, basing its risk assessment on the potential effect of fallout radiation on the resident population over a period of one week following the deposition of fallout and the efficacy of shelter protection to mitigate such exposure. Longer-term effects (additional cancer deaths and potential death in future progeny) were also considered.

To determine risk levels for U.S. counties, NAPB-90 employed the combined results of 12 "most-likely" wind patterns--one such pattern for each month of the year--and used the highest resulting radiation effect in each county as its potential risk level.

Four levels of potential fallout risk were defined:

- Very High Fallout Risk Counties were defined as those which have the potential to receive a one-week unprotected radiation dose of equal to or greater than 15,000 roentgens (R). The counties which were defined at this risk level have resident populations totaling 9.6 millions (4 percent of the U.S.) and cover approximately 421,669 square miles.

- High Fallout Risk Counties were defined as those which have the potential to receive a one-week unprotected radiation dose of equal to or greater than 6,000 roentgens but less than 15,000 roentgens. The counties which were defined at this risk level have resident populations totaling 49.2 millions (20 percent of the U.S.) and cover approximately 624,407 square miles.

- Medium Fallout Risk Counties were defined as those which have the potential to receive a one-week unprotected radiation dose of equal to or greater than 3,000 roentgens but less than 6,000 roentgens. The counties which were defined at this risk level have resident populations totaling 62.6 millions (26 percent of the U.S.) and cover approximately 618,811 square miles.

- Low Fallout Risk Counties were defined as those which have the potential to receive a one-week unprotected radiation dose of less than 3,000 roentgens. The counties which were defined at this risk level have resident populations totaling 120.8 millions (50 percent of the U.S.) and cover approximately 1,886,339 square miles.

NAPB-90 does not recommend the types and degree of shelter protection best suited to the individual fallout risk areas, but rather delineates the short and long-term consequences of selecting shelter of varying quality, stressing that the ultimate aim is "zero exposure."

Fire Risk - The risk of potential thermal and secondary blast-ignited fires created is directly related to the risk from blast overpressures. Hence, NAPB-90 defined the fire risk as coexistent with that risk, delineating three degrees of risk:

- Very High Fire Risk Areas exist where blast overpressures equal or exceed 5.0 psi, that is, the areas defined as at very high and high direct effects risk. Survivors in these areas would almost certainly perish should any fires occur since search and rescue, evacuation, and fire fighting are considered almost impossible to accomplish.

- High Fire Risk Areas exist where blast overpressures are greater than 2.0 psi but less than 5.0 psi, that is, the areas defined as at medium direct effects risk. The characteristics of damage created by this range of overpressure (generally standing but heavily damaged buildings) are conducive to the generation and spread of mass fires. As in the Very High Fire Threat Area, emergency operations to assist survivors as well as to control or extinguish fires are almost impossible to accomplish.

- Medium Fire Risk Areas comprise the remainder of the area of potential blast overpressure, that is, the area experiencing equal to 0.5 psi but less than 2.0 psi. While blast-induced fires are less likely at this range of overpressure, thermal ignitions remain a distinct hazard, particularly when such ignitions occur indoors.

U.S. Department of Homeland Security
500 C Street, SW
Washington, DC 20472

FEMA

April 27, 2005

Steven Aftergood
Federation of American Scientists
1717 K St, NW
Washington, DC 20036

RE: Freedom of Information Act Request
FOIA Case No.: 04-098

Dear Mr. Aftergood:

This letter is in response to Allen Thomson's February 12, 2004 Freedom of Information Act (FOIA) request. In that request, he asked for a copy of "Nuclear Attack Planning Base 1990 Final Project Report," dated April 1987, an out-of-print FEMA publication.

In responding to a FOIA request, the U.S. Department of Homeland Security (DHS)/Federal Emergency Management Agency's (FEMA's) search will include responsive records in its control on the date the search began. FEMA's search began on February 19, 2004.

Your request is granted in full at no cost to you. Please include the following caveat in any further posting of this publication. "This publication was provided by the Federal Emergency Management Agency, Department of Homeland Security, for its academic and historical value only." Enclosed please find the FEMA library reference copy on loan to you for duplication. Kindly return the publication to me when you complete the task and include the url information for your website.

For your information, this FOIA request, including Mr. Thomson's identity and the information made available, is releasable to the public under subsequent FOIA requests. In responding to these requests, FEMA does not release personal privacy information, such as home address, telephone number, or social security number, all of which are protected from disclosure under FOIA Exemption 6.

Thank you for your interest in FEMA's programs and policies.

Sincerely,

Elaine I. Chan

Elaine I. Chan
General Attorney
Office of General Counsel
500 C St, SW
Washington, DC 20472

Enclosure
Cc: Allen Thomson

Federal Emergency Management Agency

NUCLEAR ATTACK PLANNING BASE - 1990 (NAPB-90)

FINAL PROJECT REPORT

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ANNEX A: DIRECT EFFECTS/FIRE RISK - STATISTICS & MAPS

ANNEX B: FALLOUT RISK - STATISTICS & MAPS

ACKNOWLEDGMENTS

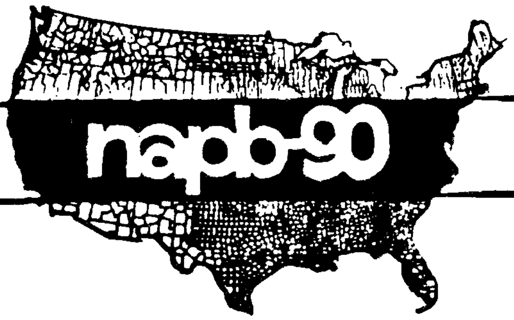
This report represents many hours of work by professionals in and out of government whose experience and knowledge covered a wide spectrum of academic and governmental disciplines in nuclear weapons effects and civil preparedness planning. Grateful acknowledgment is made for the contributions of participants of the informal Nuclear Attack Planning Base - 1990 Working Group who met voluntarily to discuss, debate, and decide policy and planning considerations. In this regard, special acknowledgment should be made of the high degree of professionalism displayed by Donald Moore and his staff in the Systems Development Division, OP-IR-SD, in the generation of computer data for Working Group discussions and for this report.

Lastly, I must acknowledge the welcome advice, encouragement, and generous support accorded this project by Joseph A. Moreland, Assistant Associate Director, SL-EM.

The final shape and thrust of NAPB-90 is the result of the unstinting dedication, enthusiasm, and effort of all project participants.

Ronald F. Treichel
Executive Officer, SL-EM
NAPB-90 Project Coordinator

PART 1. PROJECT OVERVIEW



A. General Overview - The NAPB-90 project was an in-house effort of the Federal Emergency Management Agency (FEMA) carried out over a year and a half from early 1985 to 1986. The project was developed and coordinated by the Office of Emergency Management Programs, of the State and Local Programs and Support Directorate, and involved professionals and experts from FEMA directorates and offices, other Federal departments and agencies, and the private sector.

1. Purpose - The current nuclear attack planning base outlined in FEMA publication TR-82, "High Risk Areas for Civil Preparedness Nuclear Planning Purposes," which represented a 1975 assessment of the potential effects of nuclear attack through 1985. Since its publication, major changes have occurred which make this planning base obsolete. These changes are discussed below. NAPB-90 replaces TR-82 and provides a nuclear attack planning base for assessing and planning for preparedness measures for today and through 1990. The unprecedented destructiveness of strategic nuclear weapons and the possibility (however remote) of their use in war deserve the serious concern of government at all levels.

2. Scope - NAPB-90 is an estimate of the potential physical effects of a nuclear war on the population and land area of the United States in terms of the degree of the potential risk from these effects. In developing such risk assessments, the project incorporated publicly available data on Soviet nuclear warfighting objectives; the strategic nuclear arsenals available to carry out such an attack; and Soviet targeting objectives and force deployment procedures.

Three types of potential nuclear attack effects risks and the areas and populations affected by each are defined by NAPB-90:

- The potential direct effects risk from blast overpressure generated by the explosion of a nuclear weapon (measured in pounds per square inch [psi] over normal air pressure);

- The potential risk from thermal and secondary blast-ignited fires created by the combined effects of blast overpressure damage and the thermal pulse (or fireball) of a weapon; and

- The risk from potential fallout radiation generated by surface-burst nuclear weapons.

All attack effects were determined using the FEMA READY nuclear effects assessment system and the FEMA Population Grid File (PGF). All computer work was under the supervision of the Computer Systems Division, Office of Information Resources Management, Emergency Operations Directorate. In most instances, NAPB-90 potential risk areas were defined to match complementary preparedness measures necessary to mitigate weapon effects, as well as long-term steps to maintain life support in the threat area. Risk area definitions are found in Part 3, "Risk Definitions." Specifically identified areas and populations affected are outlined in Part 3.A. "Direct Effects Risk;" Part 3.B., "Fallout Risk;" and Part 3.C., "Thermal and Secondary Blast Fire Risk." Annexes A and B contain statistics and maps concerning these threats.

3. Limitations - NAPB-90 was developed after detailed studies of all aspects of nuclear attack planning. Despite such efforts, there is no way to assign specific confidence limits to either the implicit or the explicit assumptions used regarding targeting, weapon yields and designs, heights of burst, accuracy, and delivery system reliability. The only confidence which can be claimed by NAPB-90 is that it represents a credible estimate of the potential risk from a large-scale nuclear attack on the U.S., having been constructed on logical, studied assumptions and available emperical data. Hence:

- NAPB-90 cannot be used to predict how a nuclear war would be fought against the U.S. but merely identifies areas and populations which are at potential risk from nuclear weapon effects;
- NAPB-90 does not speculate on the strategic priority which might be given specific targets by Soviet planners (although an overriding assumption would be that destruction of U.S. strategic counterforce facilities would be a very high priority). The planning base, therefore, represents no specific war-fighting scenario;
- NAPB-90 acknowledges only the classes of targets used in the development of the planning base but does not identify individual targets by their strategic value (see Part 2.b., "Target Selection");
- NAPB-90 makes no assumptions regarding potential population casualties acknowledging only the numbers of residents, day-to-day populations within defined risk areas; and
- NAPB-90 does not purport to be totally predictive (100 percent correct) in its presentation of potential risks from direct effects, fire, and fallout. This is particularly true for fallout risk area definitions where the total risk following an attack would be driven by weather conditions at that time.

In short, no nuclear attack planning base or any study involving nuclear war can claim total accuracy since there is no way of knowing Soviet war plans.

B. TR-82 vs. NAPB-90 - As stated earlier, the purpose of the NAPB-90 project was to update and replace the nuclear attack planning base represented in FEMA publication TR-82, 1979. While a comparison of the differences between TR-82 and NAPB-90 is difficult since each base approached the problem of defining risk uniquely, the following is presented as illustrative of the differences in the approaches to define potential risks.

1. General Comparisons - While NAPB-90 projections on populations and areas subject to nuclear attack effects are configured differently than in TR-82, a general comparison of compatible data can illustrate the significant differences between the two bases.

To determine risk areas, NAPB-90 employed the FEMA Population Grid File (PGF) which divides the U.S. land area into squares of 2 minutes latitude and longitude. Each square is approximately 2 1/4 miles per side, or roughly 5 square miles in area. The center of each square is used as a reference point for all resources within the square. A total of approximately 115,000 such points constitute the entire file.

Overpressure computations were done at 2-mile intervals from the assumed ground zero (detonation point or AGZ) of a weapon for total distances of 25 miles in all compass directions. These generated 2-mile intervals from the AGZ coincide with the grids of the PGF.

Fallout computations were done at 10-mile intervals, effectively at each corner of a 10-mile grid using approximately 55,000 such points.

The basic data of each grid point are the resident population of the square and standard Bureau of the Census geographic codes (State, county, minor civil division, and Standard Metropolitan Area, as applicable). In addition, applicable resources data were identified by geographic location (i.e., latitude and longitude coordinates), summarized, and "attached" to the appropriate PGF point. Finally, overpressure and fallout effects were overlayed on the PGF for effects analysis.

The developers of TR-82 used the bounding limit of 2.0 psi overpressure as a definition of risk from nuclear detonations. The reason for this choice is sound, but NAPB-90 expanded and refined this single definition of blast risk. This bounding limit, however, provides a basis for a general comparison between NAPB-90 and TR-82. There were 829 whole counties which the TR-82 planning base defined as having at least one PGF point at 2.0 psi or more overpressure.

Using the same measurement for comparison of the two planning bases, there were 326 counties included in this risk definition in the NAPB-90 but which were not so identified in the TR-82 base, i.e., newly identified as at this risk level. Conversely, 190 counties at this risk level in TR-82 were no longer identified at this risk level in NAPB-90.

In sum, a total of 972 counties--a net increase of 136 counties--was identified at this risk level by NAPB-90.

Using estimated 1985 populations of only those PGF points in both planning bases which meet the 2.0 or more psi risk definition provide another comparison between the two bases:

	TR-82	NAPB-90
Population at 2 psi risk or greater	155.86 Million	129.74 Million
Population outside 2 psi risk area	85.79 Million	111.91 Million
Total 1985 U.S. population	241.65 Million	241.65 Million

As stated earlier, the reasons for this difference are numerous but can be summarized by stating that NAPB-90 was developed from a strategic targeter's force application viewpoint (how weapons would logically be used against targets). By contrast, the TR-82 planning base weapon employments deliberately created a "worst-worst" risk environment through the employment of all weapons in both air- and ground-burst modes for each aim point.

A secondary but important reason for this difference can be found in the weapon yields employed by both planning bases. The average assumed yield of all weapons used in NAPB-90 is slightly less than 1 megaton, reflecting the trend in Soviet (and in U.S.) strategic inventories toward smaller, more accurate weapons. By contrast, TR-82 employed then-current, high-yield Soviet weapons with yields as high as 20 megatons.

2. General Characteristics - The NAPB-90 and TR-82 planning bases have the following general characteristics in common, in opposition, or singularly:

TR-82	NAPB-90
° Risk assessment (see below) based upon "worst-worst" weapon employment	° Risk assessments based upon estimates of Soviet weapon employment
° Target priorities by class acknowledged but not used in application to preparedness programs (all risk areas assumed to be at equal risk)	° SAME; no change
° Illustrated publication showing maps with 2 psi blast envelopes (red) and high fallout risk counties (green)	° TO BE DETERMINED
° Planning base information made available for unlimited distribution to State and local governments and the public	° SAME; deployment to be determined

3. Target Classes - The NAPB-90 and TR-82 planning bases have the following target class characteristics in common, in opposition, or singularly:

TR-82	NAPB-90
° Selection of target classes based on the following criteria in descending order of priority:	° Selection of target classes based on recent data and the following headings:
-- U.S. Military Installations	-- Strategic Military Installations
-- NO COMPARABLE CLASS (included in target class above)	-- Non-Strategic, Other Military Installations and Bases
-- Military-Support Industry, Transportation, and Logistics	-- SAME, less Transportation and Logistics
-- Other basic industries and facilities that contribute significantly to maintaining U.S. economy	-- NO COMPARABLE CLASS
-- Population concentrations of 50,000 or more (Bureau of Census urbanized areas) not otherwise targeted	-- NO COMPARABLE CLASS
-- NO COMPARABLE CLASS	-- Ports
-- NO COMPARABLE CLASS	-- Petroleum Refineries
-- NO COMPARABLE CLASS	-- Political
-- NO COMPARABLE CLASS	-- Electric Power Plants
-- NO COMPARABLE CLASS	-- Chemical Industries
° Based on 1980 projections of Soviet capabilities; weapon employments developed considering active U.S. defenses, vulnerability, and time-sensitivity of targets; maximized target destruction; minimized weapons employed	° Virtually the same technique; used current-to-1990 Soviet weaponry; time-sensitivity of targets not a consideration
° Probable targets reviewed to eliminate isolated military and industrial facilities considered of marginal significance	° Editing of target classes done to conform with perceived Soviet strategic principles

° States given an opportunity to present justification for addition or deletion of targets they deemed at risk from nuclear attack effects; approved or disapproved at national level	° Virtually the same; methods of implementation to be determined

4. Assessments - The NAPB-90 and TR-82 planning bases have the following risk assessment characteristics in common, in opposition, or singularly:

TR-82	NAPB-90
° All weapons air burst to maximum ground range of 10.0 psi overpressure to attain worst case	° Weapons employed in accordance with perceived Soviet force application and targeting principles
° Blast envelopes depicted risk areas subject to a 50 percent or greater probability of receiving 2.0 psi overpressure or more	° Four direct effects risk levels identified (see Part 3.A., "Direct Effects Risk")
° Risk from thermal fire assigned to extent of 2.0 psi risk area	° Thermal and secondary blast fire fire risk identified (see Part 3.C., "Thermal and Secondary Blast Fire Risk")
° All weapons ground burst to maximize fallout radiation for worst case	° Fallout radiation risk determined from ground-burst weapons only
° High-risk fallout areas (whole counties) designated where there was 50 percent or greater probability of receiving an H+1 dose rate of 10,000 R or greater per hour for any of four seasonal winds (1975 publication only)	° Four fallout radiation risk levels identified (see Part 3.b., "Fallout Risk")

A. Soviet Strategic Policies - An initial study of Soviet military objectives, war-fighting scenarios, targeting strategies, and force applications provided the basis for many of the development procedures and policies of NAPB-90.

The study examined stated Soviet views on how they envisioned a nuclear war against the U.S. would be fought. Observations relevant to the development of NAPB-90 were adopted to the extent possible.

1. Soviet Nuclear War-Fighting Objectives - Almost all official pronouncements on this subject (culled from Soviet media) indicate that their main objective in a nuclear war is to attain "victory" over the enemy. Victory, by Soviet definition, is the destruction of the enemy government that started the war, and the disarming and neutralization of the enemy's military forces. Such a war is usually described as "imperialistic" forces facing "socialism" or "socialist coalitions."

In the development of the NAPB-90 target base, close attention was paid to frequent Soviet references to limiting damage to non-target resources of the enemy. This damage-limiting element of the Soviet nuclear war-fighting objectives significantly influenced the procedures used in making final NAPB-90 target aim point selections.

2. Soviet Nuclear War-Fighting Scenarios - Another important influence in the NAPB-90 development was how the Soviets perceived nuclear war would begin and how each scenario would effect their selection of potential targets. The Soviets see three possible scenarios as most likely to start a nuclear war:

- Preemptive attack on strategic warning of enemy attack;
- Launch on tactical warning; and
- Attack in retaliation for being attacked.

Under all of these scenarios, Soviet targeting objectives remained the same. The final NAPB-90 was, therefore, designed to reflect these objectives and is not a prediction of the results of any war-fighting scenario envisioned by the Soviets or by U.S. planners. The decision to make the NAPB-90 planning base scenario-independent is reinforced by the fact that Soviet targeting priorities, as with their objectives, "remain essentially the same" regardless of the *a priori* scenario under which weapons would be employed.

It was also significant to note that should the Soviets be faced with their scenario which calls for a retaliatory strike after being attacked, they do not see such a strike as "...designed simply to inflict an unacceptable level of damage, the threat of which should have deterred the enemy in the first place."

As to how long a nuclear conflict would last, the Soviets believe that a war "...is more likely to begin with a crisis period in which both sides would ready their forces and take measures to protect their economics (sic) and population." Also, most Soviet authorities see a conventional war phase preceding a nuclear war, with escalation into the use of nuclear weapons as "inevitable."

These Soviet perceptions on the conditions under which nuclear war would start were important factors in determining NAPB-90 planning policies and assumptions to mitigate the nuclear effects risk environments that might result.

3. Soviet Targeting Strategies - Publications carrying speeches and articles by top Soviet military and political leaders make clear that the targets of the Soviet "Strategic Nuclear Forces" reflect their objectives discussed above. Specific NAPB-90 target selection (discussed at length elsewhere in this paper) is based on these Soviet target selections. An important point in their selections is that population, as such, is not specified as a Soviet target.

4. Soviet Force Application - The Soviet application of their nuclear targeting strategy follows these force-application principles, most of which influenced the development of the NAPB-90 target base:

- Destroy "most threatening" enemy forces;
- Select "main links and nodes" in target "sets" (such as the National Command Authority);
- "Do not destroy large areas or create radioactive deserts;"
- Use minimum weapon yields ("explosive power") necessary so as not to drastically "overkill" the target;
- "Prepare to strike most important targets twice;" and
- "It is not possible, nor desirable, nor necessary to attack and destroy all targets (in the operational zone)."

These force-application principles (among many more) agree with Soviet doctrines and strategies discussed above. The "enemy" is to be defeated through destruction of its military forces and by preventing their reconstitution.

B. NAPB-90 Target Selection Considerations - Ten target classes containing 6,139 aim points were included in an initial target set as follows:

Target Class	Aim Points
° ICBM silos and launch control centers	1,228
° Other Air Force facilities and complexes	199
° Other Army facilities and complexes	159
° Other Navy facilities and complexes	110
Total other military facilities and complexes	(468)
° Key military-support industries	325
° Political infrastructure	44
° Ports and port facilities	106
° Petroleum refineries	242
° Electric power generating facilities	1,632
° Chemical industry facilities	2,094
Total Initial Aim Points	6,139

The initial target set served as a basis for aim point editing to meet Soviet strategic objectives.

1. Military Aim Point Editing - In the ICBM silos and launch control center class, all aim points included in the Titan missile complexes at Little Rock Air Force Base (AFB), Little Rock, Arkansas; McConnell AFB, Wichita, Kansas; and Davis Monthan AFB, Tucson, Arizona, were eliminated. All of these missile complexes are being or will be phased out within the 1985-1990 period and will, therefore, cease to be potential targets.

2. Editing of Industrial Aim Points - Over 60 percent of the original aim points listed above occurred in three target classes: petroleum refineries, electric power generating facilities, and chemical industry facilities. This large number made it obvious that these classes would require extensive editing since they covered the majority of industrial facilities in each class, a large number of which were small industries not considered significant enough to be included for national damage assessment purposes.

a. Editing of Petroleum Refineries Class - For the editing of the petroleum refineries class, no refinery with a capacity of less than 75,000 barrels per day was considered a potential target. The remaining industries in the class were targeted. It was assumed that a rank order degradation of refinery capacities to an assured level of 75 percent damage or destruction would constitute effective neutralization of the industry without its total destruction.

b. Editing of Electric Power Generating Facilities Class - For the editing of the electric power generating facilities class, facilities were ranked ordered by generating capacity. These site capacities were then selectively targeted until an assured 75 percent degradation was achieved. This level of degradation was assumed to effectively neutralize the capability of the electric power grid network to transmit or exchange generated power, and also did not totally destroy the industry as a whole.

c. Editing of Chemical Industry Class - The basis for editing the chemical industry class was a Stanford Research Institute study done for the Office of Civil Defense in 1968. This study was an assessment of the severity of damage to the chemical industry as a result of nuclear war. It indicated that the worst-case scenario for the chemical industry as a whole would be the damage or destruction of those chemical facilities furnishing "basic" chemicals--chemicals necessary or common to a chemical industry itself as well as to other industries. These basic chemical industries include those which manufacture alkalines and chlorines, industrial gases, inorganic and organic chemicals, and pigments (grouped under the Standard Industrial Code 281 category). Aim points for this category were selected and targeted to provide an assured neutralization of all other chemical industries. These aim points replaced the initial chemical class listing.

C. NAPB-90 Weapon Inventory File - The Soviet strategic weapon arsenal used as the initial NAPB-90 weapon inventory file was developed from a Soviet inventory published in a report by the Congressional Budget Office (CBO) titled "Counterforce Issues for U.S. Nuclear Forces," January 1978. The report projected Soviet strategic forces through 1985. Since NAPB-90 is intended to reflect a threat planning base through 1990, the CBO data were selectively modified to reflect probable changes in currently deployed Soviet strategic forces through 1990. Table C-1 shows the initial CBO data together with the predicted changes. Notes on these and other changes reflect 1990 Soviet strategic weapon deployments reflected in a Department of Defense report, "Soviet Military Power," fourth edition, April 1985.

Table C-1. Established Soviet Military Forces, 1985

Launch Vehicle	Number in Inventory	Warheads Each	Warheads Total
INTERCONTINENTAL BALLISTIC MISSILES			
SS-11 1/	420	1	420
SS-13 2/	60	1	60
SS-17 3/	150	4	600
SS-18 4/	308	10	3030
SS-19 5/	360	6	2160
TOTAL ICBM	1298		6300
SUBMARINE-LAUNCHED BALLISTIC MISSILES			
SS-N-6/8 6/	600	1	600
SS-N-17/18 7/	300	3	900
TOTAL SLBM	900		1500

Notes on projected 1990 force posture are found on next page.

1/ Mods #2 and #3 are principally deployed; 420 launch vehicles total.
2/ No change from 1985 deployment posture.
3/ Mod #3 deployed; 150 launch vehicles total.
4/ Mod #4 deployed; 308 launch vehicles total with 10 warheads each.
5/ Mod #3 deployed; 360 launch vehicles.
6/ For the SS-N-6, Mods #2 and #3 deployed; Mod #3 will have 2 warheads each. For the SS-N-8, Mod #2 deployed.
7/ The SS-N-17 had limited deployment. For SS-N-18, Mod #3 deployment is assumed; will have 7 warheads each.

New Vehicles: ICBMs: SS-X-24 and SS-25 have limited deployment.
SLBMs: SS-N-20 deployed; 6 to 9 warheads each. SS-NX-23 to be deployed on Delta IV class submarines.

Although standard weapon employment procedures were followed, closer attention was paid to the assumed weapon yields which could influence the extent and degree of potential risk, as well as the probability of that risk occurring in a given area than to the weapon delivery system employed.

While all actions were taken to ensure a realistic representation of Soviet strategic nuclear force applications, it should be emphasized that NAPB-90 does not attempt to predict the specific weapons applications of Soviet strategic planners. The structure of the final Soviet weapon systems used has, therefore, little relevance to the planning purpose of the base, i.e., to depict potential nuclear weapons effects.

D. Targeting Considerations - It was pointed out earlier that one of the principal differences between the TR-82 planning base and NAPB-90 lay in the manner in which weapons were employed against potential targets. NAPB-90 aim points were attacked using estimates of Soviet strategic targeting procedures, i.e., Soviet views on nuclear weapons effects and target vulnerabilities. The following discusses targeting considerations employed by NAPB-90:

1. Height of Weapon Detonation - A nuclear weapon generates very large blast overpressures. The range or extent of this blast overpressure is closely related to the height of burst (HOB) of the weapon. Nominally, this is referred to as an "optimum HOB" since it represents the height chosen by the strategic planner to maximize desired levels of overpressures over the widest possible area. A particular overpressure level is chosen to assure the desired damage or destruction of the target.

The optimum HOB selected for NAPB-90 "soft" or area targets (such as a large industrial facility) normally precludes the weapon's fireball from reaching the ground. In these cases, the weapon can be said to be "air-burst."

When the fireball in whole or in part touches the ground, the weapon is considered "surface-burst." NAPB-90 employed surface burst weapons against "hard" or point targets (such as missile siloes).

In both cases, NAPB-90 weapons were employed at an altitude which assured generation of the overpressure believed necessary to damage or destroy the potential target.

2. Target Surface Characteristics - NAPB-90 weapon employment considered the influences on the extent of overpressure generated by weapon detonations--ranges significantly influenced by the surface characteristics of the target. These characteristics have a marked effect on the range of overpressures, each surface characteristic having its own optimum HOB to maximize particular psi overpressures. The reasons for these differences are discussed below.

- Ideal surfaces are perfectly flat terrain and reflect all of the overpressure (or "mechanical") and thermal (or "heat") energies of the weapon, i.e., nothing inhibits the spread or range of these effects. Ideal surfaces are used as a hypothetical "base case" for weapon characteristics. No such surfaces exist on earth.

- Near-ideal surfaces are "reasonably" flat terrains and reflect most of the mechanical and thermal energy of the weapon. Ice, hard-packed snow, water, and frozen tundra are examples of this type of surface. Inhibitions of generated energies on this type of surface are small.

- Non-ideal surfaces are flat to uneven terrains which can interact with the thermal energy of the weapon through ignition of surface material and the generation of large amounts of dust and debris. The dust and debris absorb some of the thermal energy and heat the air above normal temperature around the target. Together with the dust, this higher air temperature "pocket" interacts with the reflection of the blast wave off of the surface and a "precursor" or leading pressure wave is formed. The result is that the range of mechanical overpressures is reduced and the dynamic or "punch" pressure is increased.

Weapon effects on near- and non-ideal surfaces can be further influenced by types of soil, the degree and density of vegetation, and the amount of moisture present in the area. All of these additional characteristics inhibit the range of overpressures. Strategic planners refer to such surface characteristics as "grey areas" in calculating optimum HOB's.

3. Target Vulnerability - The choices of weapons employed by NAPB-90 were based upon the weapon HOB necessary to maximize selected overpressures. The overpressure selected was based upon the vulnerability of the target and the desired level of damage or destruction to be achieved. The "soft" targets discussed earlier are generally vulnerable to low levels of overpressure (some industrial plants will sustain substantial damage at as low as 3.0 psi). "Hard" targets require very much higher overpressures to effect damage or destruction.

As a general rule, then, a soft target in the NAPB-90 listing was attacked with an air-burst weapon to achieve the widest possible range of the desired blast overpressure and employment of the weapon did not generally result in the creation of fallout (see a discussion of this in Part 3.B., "Fallout Risk"). The converse applied to very low or surface-burst weapons which NAPB-90 employed against hard targets.

4. Probability of Damage or Destruction - A strategic planner works to assure that a chosen target will be damaged or destroyed. If all weapon employment considerations are correct and the weapon detonates at the aim point, damage or destruction will (theoretically) be assured. Weapon systems, however, are not 100 percent reliable. To add assurance that the goal will be met, NAPB-90 weapon employment considered two other factors:

- The accuracy of the weapon - NAPB-90 aim points represented the desired point of weapon detonation (nominally, the "desired ground zero" or DGZ). Weapon guidance systems, however, will usually deviate from this DGZ by a predictable distance and probability. The amount of this deviation, measured in feet from the DGZ, represents the radius of a circle around the DGZ within which the weapon can be expected to impact a warhead at least 50 percent of the time. This deviation is called the "circle error probable" or CEP of the weapon. NAPB-90 weapon employed considered CEP's to determine the HOB of the weapon to ensure that desired overpressure ranges would reach the target.

- The probability of arrival of the weapon - This is an expression of the combined probability the launch vehicle will (1) have a successful launch; (2) follow its programmed trajectory or course; and (3) its weapon detonates upon arrival at the target. NAPB-90 considered the probability of arrival of the weapon to determine if multiple weapons were needed to ensure destruction of the target.

E. Other NAPB-90 Considerations

1. "Nuclear Winter" - In 1984, a group of scientists produced a study which hypothesized that a large-scale attack on the U.S., principally against urban areas, would result in an injection into the atmosphere of an inordinate amount of smoke and soot from attack-generated fires. Their study (called "TTAPS" after the initials of the co-authors) predicted that a severe drop in temperature or a "Nuclear Winter" would result from the sun's energy being absorbed by the cover of smoke and soot. The study produced widespread interest within the scientific community, the media, and among the general public.

In the intervening time since its publication, a large number of scientists (including some of the original authors) and scientific organizations (such as the National Academy of Sciences) have acknowledged that there are uncertainties connected with the original hypothesis. Some investigations made since the TTAPS study have suggested that the amount of smoke and soot produced may be much less than that predicted by the study. Weather conditions, such as cloud cover and turbulence due to uneven smoke and soot distributions, may accelerate the "cleansing" of the atmosphere more rapidly than originally suggested. The hypothesis also depends on a number of broad assumptions of local weather conditions, the distribution pattern of the smoke and soot in the upper atmosphere, the number and location of targets that will be attacked, the amount of available fire fuel in the target area which will ignite and burn, and the like. The current trend in both Soviet and U.S. warheads toward more accurate, low-yield weapons designed to limit collateral damage around a target has also suggested the effects may be less severe than those suggested by the study.

Until these uncertainties are resolved, the concept of a "nuclear winter" as predicted by the TTAPS study does not justify a shift in current civil preparedness planning and policy. Until more research and study are carried on this potential phenomenon, such an hypothesis cannot be incorporated into a civil preparedness planning base.

In the interim, NAPB-90 provides an objective analysis of the known potential nuclear attack effects.

2. Electromagnetic Pulse (EMP) - A secondary but nevertheless important effect of any nuclear detonation appears as an electromagnetic pulse. It is another form of energy released by the weapon in the electromagnetic radiation spectrum. At the high end of this spectrum, the weapon generates initial nuclear radiation (X-rays and gamma rays) at the moment of explosion; thermal radiation energies given off by the explosion are in the infrared and ultraviolet frequencies of the spectrum; and the electromagnetic pulse (composed of electrons) covers the lower end of the spectrum. The frequencies in this part of the spectrum are among those used in electric power generation, many forms of radio and television transmission, and military communications and detection systems.

The EMP effect resulting from a nuclear detonation within the earth's atmosphere is generally not significant, but if high yield weapons are detonated outside of the atmosphere, an efficient conversion of nuclear energy into the eletromagnetic frequency range occurs. This energy can cover a very substantial area and has the capability of "coupling with and affecting the operation of electrical and electronic equipment which has not been protected. Examples of EMP damage observed during the atmospheric test programs ranged from damaged cables due to "arc-overs" to the false tripping of street light systems many hundreds of miles from the detonation point. Similar results have been observed for modern, sophisticated equipment exposed to simulated EMP. Such equipment, if not otherwise protected, has a very high probability of becoming inoperative at even very low levels of EMP. In general, the more modern and sophisticated the equipment, the higher the potential for EMP degradation.

These and other concerns about the potential EMP damage to electric power and communications systems certainly demand the attention of emergency planners. Preparedness measures to mitigate the blast, fire, and fallout risks outlined by NAPB-90, as well as long-term measures to maintain life support, must consider the possibility of additional burdens imposed by EMP before, during, or after a nuclear attack.

The effect of the potential use of nuclear weapons to deliberately create an EMP effect is, however, considered to be a war-fighting option. Since NAPB-90 is scenario-independent and does not purport to predict how a nuclear war would be fought, EMP must be considered outside its scope.

3. Strategic Defense Initiative (SDI) - In 1983, the Administration proposed that a strategic defense be initiated to explore the feasibility of providing a defense against ballistic missiles. Research was begun on technologies which could support a capability to engage and destroy hostile ballistic missiles during four phases of the missiles' flight paths:

- The boost or launch phase while the missile is accelerating;
- The mid-course or post-boost phase when the propulsion rockets of the missile have separated from the warhead;
- The mid-course phase when the warhead goes through the topmost section of its ballistic path; and
- The terminal phase when the warhead is in its final descent toward the target.

In short, SDI research is exploring the feasibility of a multi-layered space defense shield along the entire spectrum of the flight of a ballistic missile. What configuration this multi-layered approach will take if employed, is not now known. Hence, the exact relationship of SDI and the civil preparedness program cannot be determined. A deployed strategic defense probably will not be able to determine--in the boost and mid-course phases--which U.S. targets had been spared by the destruction of a single missile. On the other hand, this relationship could be surmised when terminal phase defenses have been emplaced to protect specific targets. For targets not protected by a terminal defense, potential targets following activation of the strategic defense could not be realistically determined.

For the foreseeable future, then, planning against the potential effects of a nuclear war must be based on current and predicted offensive nuclear forces which could be employed against U.S. targets.

F. References - The following publications were used in the development of NAPB-90. Except where noted, all are available in the public domain:

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PART 3. RISK DEFINITIONS

A. Direct Effects Risk

1. General Overview - Blast overpressures generated by a nuclear weapon detonation present the greatest risk to human life and health in a nuclear effects environment because achieving effective protection is so difficult. The destruction, death, and injury that can result from the blast generated overpressures of modern nuclear weapons are awesome compared to those from the atomic weapons used against Hiroshima and Nagasaki, Japan, in World War II. Although current thermonuclear weapons have diminished in yields (principally because of greater accuracy), the power generated is still magnitudes above that released by the earlier weapons.

Protective measures against direct effects of weapons have been researched and are possible but generally impractical due to the enormous expenditures entailed in the construction of a comprehensive blast shelter system. Over the years, proposals to initiate a combined blast and fallout shelter program have been submitted to the Congress but not accepted. In some areas close to the point of detonation (which can never be predicted accurately) even extensive protective measures may be inadequate and, even if successful in mitigating initial effects, may be insufficient to support continued habitation of the area.

Fire generated by the thermal pulse of the weapon and by damage-induced ruptures in gas and electric lines also could present a formidable risk for survivors close in to the target aim point. The fire risk is discussed in C., below.

Even in areas far enough from the point of detonation to escape severe damage, the population still faces unique survival problems to protect their lives and continued health in the direct effects environment.

2. Extent of Risk - The extent and range affected by this risk are determined by:

- The altitude at which the weapon is detonated (see the discussion of this in Part 2.D., "Targeting Considerations"). The altitude at which the weapon is detonated determines the range of given overpressures.

- The yield of the weapon. The range of a given blast overpressure increases with the cube root of the weapon yield in kilotons and is directly correlated to the height of burst.

- The accuracy of the weapon (see the discussion of this in Part 2.D., "Targeting Considerations"). Weapons used in NAPB-90 were assumed to have extremely small CEP's. CEP's, therefore, have little effect on the extent of the damage area and influence only the location of the damage.

- The probability of arrival of the weapon (see the discussion of this in Part 2.D., "Targeting Considerations"). Weapons used in NAPB-90 were assumed to have a probability of arrival of 66 percent or greater.

3. Statistical Overview - NAPB-90 defines the potential risk from nuclear weapon blast overpressures as the total area affected by 0.5 pound per square inch (psi) or more. This represents 727,112 square miles of U.S. territory with an estimated resident population of 175.11 millions. Approximately 66.54 million people, therefore, are not considered to be at risk from blast overpressures although some of this number (approximately 2.47 million) reside in areas immediately outside of the 0.5 psi boundary and may experience low levels of blast overpressure (i.e., less than 0.5 psi). Since NAPB-90 does not target population *per se*, the persons affected by blast overpressures reside in areas which are peripheral to or collocated with potential military and industrial targets (see Part 2.B., "Target Selection").

The magnitude of this potential risk is represented with maps and statistics in Annex A.

4. Methodology Employed - The selection and methodology employed for arriving at potential aim points included in NAPB-90 are discussed in detail in Part 2., "Project Development," and will not be repeated here. In general, direct effects risk areas are the result of considerations discussed in Part 2.D., "Targeting Considerations." Specific criteria used to select critical psi demarcations are included in discussions of these areas.

NAPB-90 defines four levels of potential risk from blast overpressure. Each definition is driven by the degree of influence a specific blast overpressure has on the continued life and health of the resident population. In this context, the following considerations were used in determining the degrees of direct effects risk:

- The severity of short-term risk posed by the blast wave itself in terms of its potential to kill or injure directly, or through damage or destruction of homes and buildings. This short-term risk may include the immediate effects of the weapon's thermal pulse.

- The potential long-term severity of the risk to survivors within the area by entrapment in damaged or destroyed buildings and by fires created by thermal pulse generated and damage-caused ignitions. Fire risk is discussed in C., below.

- The kind, degree, and practicality of in-place and/or crisis-generated preparedness measures necessary to mitigate initial blast, thermal pulse, and initial reation risks as well as measures necessary to assure continued life support for long-term habitation in the area. Also included in this consideration is the cost of such measures in total effort, time of preparation, and efficacy.

The potential risk from initial radiation released at the time of detonation is considered by NAPB-90 to be reciprocal with the risk from blast generated overpressure. As an example, at a distance of one mile from a one megaton air-burst detonation, initial radiation would probably prove fatal to a large portion of persons in the area even if they were shielded by 24 inches of concrete. These same people would simultaneously be exposed to blast overpressures of from 50 to 60 psi. Thus, the specific level of risk from initial radiation is difficult to define since population at risk to lethal levels of initial radiation is at double jeopardy from blast overpressure.

a. Very High Direct Effects Risk

(1) Definition - A Very High Direct Effects Risk Area is defined as the area surrounding a target aim point which has the potential to experience blast overpressures equal to or greater than 10.0 pounds per square inch (psi) from a nuclear weapon detonation.

(2) Criteria - In a Very High Direct Effects Risk Area death or severe injury from blast overpressure is certain without specially constructed protection against the blast wave and initial radiation. Survivors in this area might also face probably fatal fires generated by the thermal pulse of the weapon as well as damage-caused ignitions from ruptured gas and electric lines. This 10.0 psi limit marks the approximate median (50-50) point of lethal overpressure for persons inside homes as well as the threshold (beginning point) of possible lung damage. Beyond this demarcation, probable death and severe injury increase as overpressures increase exponentially toward the point of detonation.

While blast effects could be mitigated through specially constructed blast shelter, shelter occupants would also require protection from highly debilitating if not lethal levels of ionized radiation (neutrons and gamma rays) produced at the instant of the detonation of weapon. This initial radiation is extremely more difficult to protect against than fallout radiation produced by the fission reaction of the weapon.

In short, potential Very High Direct Effects Risk Areas are extremely dangerous for the continued protection and maintenance of human life.

(3) Overview - The total potential Very High Direct Effects Risk Areas in the U.S. cover approximately 46,352 square miles, with a resident population of 47.25 millions. Of the total U.S. area and population defined by NAPB-90 at risk from direct effects, 1.3 percent of the land area and 27.0 percent of the population fall under this risk definition. As a population group, those in potential Very High Direct Effects Risk Areas represent 19.6 percent of the total population of the U.S.

b. High Direct Effects Risk

(1) Definition - A High Direct Effects Risk Area is defined as the area around a target aim point which has the potential to experience

blast overpressures from a nuclear weapon detonation of equal to or greater than 5.0 psi but less than 10.0 psi.

(2) Criteria - A High Direct Effects Risk Area is a distinctly hazardous nuclear effects environment. Within this area lies the demarcation point of the median (50/50) probability of injury to persons within homes (approximately 7.0 psi). This is illustrative of the need for population protection measures of a prodigious nature in this area (measures which may still prove to be insufficient and impractical). Depending upon the type of construction, a large majority of homes within this area could be severely damaged or totally destroyed. Continued habitation in the area --even if survival of the initial blast overpressures were attained--would probably be impractical.

(3) Overview - The total potential High Direct Effects Risk Areas in the U.S. cover approximately 49,896 square miles with a resident population of 32.19 millions. Of the total U.S. area and population defined by NAPB-90 at risk from direct effects, 1.4 percent of the land area and 18.4 percent of the population fall under this threat definition. As a population group, those in potential High Direct Effects Risk Areas represent 13.3 percent of the total population of the U.S.

c. Medium Direct Effects Risk

(1) Definition - A Medium Direct Effects Risk Area is defined as the area surrounding a target aim point which has the potential to experience blast overpressures from a nuclear detonation of equal to or greater than 2.0 psi but less than 5.0 psi.

(2) Criteria - Unprotected and poorly protected populations in a Medium Direct Effects Risk Area have a sure probability of becoming injured or killed from either the dangers created by the blast overpressure or from the thermal pulse of a weapon. The impact lethality threshold, or the overpressure at which death could result from a body thrown by the blast, occurs within this area at approximately 3.3 psi. At approximately 2.3 psi and up, the likelihood of skull fractures increases from the same phenomenon and shattered glass and other debris impelled by the blast can be very dangerous and potentially fatal.

This area poses a risk to populations due to direct structural damage of homes and buildings. Persons caught outdoors when the detonation occurs may receive potentially severe and possibly fatal burns from the thermal pulse of the weapon. Without a detailed analysis of the specific characteristics of each area in this risk category, it must be assumed that there is a very high potential for fires that could result from the thermal pulse of the weapon or from damage-caused ignitions (see C., below). Protective measures to mitigate the immediate effects within this area are possible but time consuming and complex. Depending on the type of construction, homes and other buildings in this area would suffer moderately high to severe damage and may not be repairable. Morever, continued habitation of undamaged or repaired homes may prove difficult and impractical except for emergency reasons. Long-term preparations to sustain surviving populations may also have to take into consideration the potential lack of water pressure or electricity, as well as the complete failure of other vital community services. Finally, if downwind from a ground-burst weapon, the risk from fallout radiation may exacerbate and override the direct effects risk in this area.

(3) Overview - The total potential Medium Direct Effects Risk Areas in the U.S. cover approximately 151,535 square miles, which have a resident population of 50.3 millions., Of the total U.S. area and population defined by NAPB-90 as at risk from direct effects, 4.3 percent of the land area and 28.7 percent of the population fall under this risk definition. As a population group, those in potential Medium Direct Effects Risk Areas represent 20.8 percent of the total population of the U.S.

d. Low Direct Effects Risk

(1) Definition - A Low Direct Effects Risk Area is defined as the area surrounding a target aim point which has the potential to experience blast overpressures from a nuclear detonation of equal to or greater than 0.5 psi but less than 2.0 psi.

(2) Criteria - Blast overpressures in a Low Direct Effects Risk Area are not lethal in themselves, but serious injury or death can occur from flying debris if protection measures are not taken. In addition, the thermal pulse of the weapon in this area could result in significant first and second degree burns on exposed skin. Damage to homes and other buildings could range from low to moderately high depending upon the type of construction but would, generally, be limited to repairable damage. Repair of the area for continued long-term habitation could be a serious problem. Small but controllable fires are possible through thermal pulse ignitions of curtains, furniture, and other light flammable substances in and about homes. If uncontrolled initially, however, fires in this area might become a significant risk.

If downwind from a ground-burst weapon, this area could, within a short period of time, receive a significant amount of fallout radiation requiring additional protective measures.

(3) Overview - The total potential Low Direct Effects Risk Areas in the U.S. cover approximately 479,329 square miles, which have a resident population of 45.37 millions. Of the total U.S. area and population defined by NAPB-90 as at risk from direct effects, 13.5 percent of the land area and 25.9 percent of the population fall under this risk definition. As a population group, those in potential Low Direct Effects Risk Areas represent 18.8 percent of the total population of the U.S.

B. Fallout Radiation Risk

1. General Overview - The risk to U.S. population from gamma radiation given off from fallout particles produced by ground burst nuclear weapons is vast and far-reaching. None of the continental U.S. land area can be considered categorically secure from this risk. The two types of fallout from

a ground burst detonation are "early" (within 24 hours of the detonation) and "delayed" (after 24 hours of the detonation). Approximately 80 percent of the total radioactivity generated by a ground-burst weapon will be in the form of early fallout, with the remaining 20 percent reaching earth in the form of delayed fallout hundreds or thousands of miles from the point of detonation of the weapon. Heavier radioactive particles constitute the bulk of early fallout and fall closer in to the detonation point, while smaller, lighter particles are carried downwind eventually to fall earthward as delayed fallout. Delayed fallout, therefore, can cause radioactive contamination far beyond the range of the direct effects of the weapon detonation producing it. Given seasonal changes in weather patterns plus unpredictable local occurrences such as rain and showers, fallout must be regarded as a potential risk to all U.S. land areas.

The risk derives from human exposure to the gamma and beta radiation emitted by the fallout particles. Of these two types of radiation, protection from gamma rays is the more difficult to achieve since it requires extensive shielding ("mass") to reduce the radiation.

Gamma radiation is measured in units of roentgen (R) energy. The risk to human health and life is the amount of such energy absorbed by the body over time, called the "total dose." In most cases, a very high percentage of the total dose received will occur within the first hours after fallout arrival. In assessing the degree of risk from fallout, the total dose accumulated during a 1-week period provides an efficient standard of measurement. Table B-1 shows this and other exposure criteria for estimating the risk to human life and health from gamma radiation exposure.

Table B-1. OUTCOMES OF EXPOSURE TO GAMMA RADIATION

Persons Needing Medical Care	Accumulated R Dose Within: One Week	One Month	Four Months
NONE	150	200	300
SOME (5% may die)	250	350	500
MOST (50% may die)	450	600	---

NAPB-90 based threat assessments on the potential effect of fallout radiation on the resident population of an area over a period of 1 week following the deposition of fallout and on the efficacy of various levels of shelter protection to mitigate such exposure. While Table B-1 is useful as a guide for judging potential acute radiation penalties in a nuclear attack environment, longer term biological effects should also be considered. Using shelter offering the highest protection possible in any fallout area to limit exposure to the lowest possible level will reduce the risk of medical care for acute radiation sickness as well as the risk of longer term biological effects. In NAPB-90, assessments of longer term effects for additional survivor deaths from radiation-induced cancers as well as deaths in future progeny caused by genetic damage were calculated for a range of total exposures. These assessments were based on the assumption that exposures in a post-shelter environment (beyond 1 week) were the same as the exposure in the first week, i.e., the 1-week shelter exposure was essentially doubled to account for exposures over the longer term from remaining lower level radiation.

Estimations of potential increases in cancer deaths due to radiation exposures were based on work done by Dr. Warren Sinclair, President of the National Council on Radiation Protection and Measurements. He calculated that the cancer deaths resulting from exposures to 100R or more (but less than lethal) would be 3 percent per 100 person-roentgen (a 100 person-roentgen exposure would result if each of 100 persons were exposed to 1 roentgen, or if 50 people were exposed to 2 roentgens each, etc.). To calculate the cancer deaths for lower exposure levels, it was assumed that the percentage would decrease linearly from 3 percent per 100 person-roentgen at 100R exposure to 1.25 percent per 100 person-roentgen at 1 R exposure. Table B-2 shows these and other calculations made for other exposure levels.

The basis for data on genetic damage affecting future generations was taken from a document written by Sir Edward Pochin, former President of the International Commission on Radiation Protection as well as the British representative on the United Nations Scientific Committee on the Effects of Atomic Radiation. Dr. Pochin estimated that the increase in future deaths due to genetic damage would be 0.35 percent for each 100 person-roentgen. Calculations for other exposure levels were made accordingly as shown on Table B-2.

TABLE B-2. CANCER AND GENETIC CONSEQUENCES OF ONE-WEEK RADIATION DOSES

One-Week Acute R Dose	Assumed Total R Dose	Percent Cancer Deaths	Percent Genetic Deaths
6R	12R	0.18	0.04
12R	24R	0.40	0.08
15R	30R	0.53	0.10
30R	60R	1.40	0.21
38R	76R	2.00	0.27
50R	100R	3.00	0.35
75R	150R	4.50	0.53
100R	200R	6.00	0.70
150R	300R	9.00	1.10
188R	376R	11.00	1.30
200R	400R	12.00	1.40
250R	500R	15.00	1.80
300R	600R	18.00	2.10
375R	750R	23.00	2.60
500R	1000R	30.00	3.50
600R	1200R	36.00	4.20

These calculations are reflected in tables illustrating the consequence of shelter use for each of the risk levels discussed below.

2. Extent of the Risk. Residual radiation comes from the radioactive by-products of a nuclear detonation. The radioactive elements created by the detonation are joined with materials scoured from the crater of a ground burst weapon to form "fallout particles" which give off gamma radiation (as well as other less harmful forms of radiation). The extent of the risk portrayed by NAPB-90 was determined by:

- The fission-fusion ratio of the weapon. In a nuclear detonation, over 300 different radioactive isotopes are formed by the atomic fission ("splitting") of the uranium or plutonium used in the weapon. Atomic fusion ("joining") actions within the weapon create no harmful radioactive substances. The amount of fission products produced by the weapon is a function of the percentage of the weapon yield which results from fission. The fission-fusion ratio of an NAPB-90 weapon was assumed, for planning purposes, to be a 50-50 ratio (although fission-fusion ratios higher and lower than 0.5 are possible).

- The amount of fallout produced. Each megaton of fission energy yield (equivalent to 1 million tons of TNT explosive force) produces about 125 pounds of radioactive by-products. At the same time, a surface burst weapon vaporizes and draws upward an enormous amount of surface material (weighing up to 500,000 tons depending upon the weapon yield). This vaporized material, as it cools, combines with the fission by-products of the explosion to form fallout particles. NAPB-90 fallout risk was determined by analysis of weapons employed in a groundburst mode.

- The altitude at which the weapon is detonated. (See the discussion of this in Part 2.D., "Targeting Considerations"). Generally, the more the fireball of a surface-burst weapon makes contact with the ground, from merely touching the surface to below-ground detonations, the more ground material will be lofted and be available for combination with fission by-products to produce fallout particles. Weapons employed by NAPB-90 in this mode were also analyzed for contribution to the fallout risk.

- The distribution of fallout. The wind direction and speed in the layers of the atmosphere up to the height reached by the mushroom cloud determines the area coverage of fallout. The height of the cloud is a function of the heat generated by the weapon yield. For very large weapons the cloud could reach 15 to 20 miles in altitude. The cloud drifts away from the target in relation to the speed and direction of the winds in each atmospheric layer through which the cloud has risen. Distribution of the fallout particles to the ground is a function of wind speed and gravity. The heavier particles will fall first, while lighter particles may be carried hundreds or thousands of miles from the target area before returning to earth. (See 4., below, for a discussion of the methodology employed by NAPB-90 to determine the distribution of the fallout risk.)

° The decay rate of the radioactivity in fallout. Each of the radioactive substances produced by fission exhibits a continuous and regular decrease or decay in the amount of radiation it gives off over time. The rate of decay is expressed as the "half-life" of the element, or the amount of time necessary for its radiation intensity to be reduced by one-half the original intensity. Two fission by-products are illustrative: the half-life of radioactive iodine-131 is 8 days, while the half-life for radioactive strontium-90 is 28 years. NAPB-90 used a decay rate of radioactivity for the mix of fission by-products which is generally expressed as a ten-fold reduction in intensity for every seven-fold increment of time after detonation (e.g., the radiation intensity at some location on the ground 7 hours after detonation would be one-tenth as much as it was 1 hour after detonation if all the fallout had been deposited within the first hour).

3. Statistical Overview - NAPB-90 defined the total potential risk from fallout from its ground-burst weapons to encompass the entire U.S. land area. While it is recognized that specific nuclear attack scenarios and specific weather patterns will result in little or no fallout radiation in some land areas, NAPB-90 makes no attempt to predict such an outcome.

The magnitude of this potential risk is represented with maps and statistics in Annex B.

4. Methodology Employed - Predicting the potential distribution of delayed fallout is a difficult and uncertain task. NAPB-90 employed the GUISTO-DNAF-1 fallout model to determine potential distribution patterns. This model is efficient in determining potential fallout distribution patterns for the small-yield, ground-burst weapons (high kiloton to low megaton ranges), characteristic of weapons used in NAPB-90 (see Part 2.C., "Weapon Inventory Base"). The model incorporates wind speeds and directions ("wind shears") for various altitudes up to the height reached by the weapon's mushroom cloud, integrating all data necessary to estimate unidirectional downwind fallout distributions.

To calculate potential fallout distributions "most probable" winds for each month of the year were used. The wind patterns were developed by the U.S. Air Force Environmental Technical Applications Center following analysis of the period January 1977 through September 1981. Within this period, a specific day for each month was chosen which represented the most typical surface and upper air flow patterns, together with wind patterns for the day preceding and following the date chosen. These wind patterns are those which could most probably be expected to occur any day of a month barring unseasonal weather or future atmospheric changes to current weather patterns.

In addition to calculations described above, the results of a Defense Nuclear Agency study which assessed fallout shelter protection factors was incorporated. This study used a simulated U.S. attack with ground-burst weapons corresponding closely with the pattern used in NAPB-90. The study simulated fallout distribution using 40 randomly selected wind patterns from weather data over a 5-year period.

Both of these probable fallout distributions were used to determine the highest dose reading reached within each county unit in the U.S. This reading was recorded as the degree of potential risk for that county. The probability of the county receiving this dose over a 1-week period was not considered, but it can be said to range from "greater than zero" to 100 percent. The depicted potential risk areas in Annex B should, therefore, not be interpreted as a prediction of the fallout risk resulting from any nuclear attack. The distribution of actual fallout would be driven by weather conditions extant at the time of the attack.

As pointed out earlier, predicting potential fallout distribution is a difficult and uncertain task. Within the current state-of-the-art, there are distinct possibilities of *a priori* errors in calculations. In addition, there is the possibility of abherent, unseasonal weather patterns on any day of the year.

NAPB-90 defines four degrees of potential fallout risk. Each definition is determined by the degree of influence specific protection measures would have on mitigating human exposures to gamma radiation. In this context, the following considerations were examined to determine the degrees of potential fallout risk:

- The mitigation of a 1-week, unprotected[1/] exposure in relation to the protection factor (PF)[2/] afforded by various shelters; and
- The kind, degree, and utility of in-place or crisis-generated shelter necessary to permit continued life support in the area; and the cost, total effort, preparation time, and efficacy of such shelter.

Specific criteria used in choosing risk level demarcations are included in discussions of these areas.

a. Very High Fallout Risk

(1) Definition - A Very High Fallout Risk Area is defined as an area which has the potential to receive a 1-week unprotected radiation dose of equal to or greater than 15,000R (nominally up to 100,000R).

(2) Criteria - If the radiation levels identified as characterizing a Very High Fallout Risk Area should actually occur, death for the resident population without very high quality protection would be almost certain. Because such high quality shelter protection factors (PF's) would be

[1/] Outdoor fallout doses were calculated with no consideration for natural reductions in that dose which could be provided by the environment such as nearby buildings, lakes, ponds, streams, and surface irregularities. Average dose reductions for many outside locations might easily be half or more of the NAPB-90 levels calculated.

[2/] The protection factor (PF) of a shelter is an expression of the effectiveness of the mass or shielding provided by the structure to attentuate gamma radiation (e.g., in a PF 100 shelter, the dose rate of gamma radiation would be .01 of the outside dose rate).

needed, adequate protection in the area may be difficult, if not impossible, to find.

Chart B-3a and B-3b illustrate the consequences of selecting protection levels ranging from PF 5 through PF 500. It should be pointed out that exact radiation levels can never be determined for specific points within this area in advance of fallout arrival. Hence, a minimum PF level for the entire area cannot (and should not) be defined. Shelter with the highest PF possible should always be used in planning.

Chart B-3a. PROBABLE CONDITION OF MAJORITY OF SURVIVORS IN VERY HIGH FALLOUT RISK AREAS*

Using Shelter Protection Factor	Potential In-Shelter One Week Dose Range	Medical Care Needed	Able to Work	Probable Death Rate	Comments
PF 5 PF 10 PF 20	3000R + 1500R + 750R +	Yes	No	100%	Deaths would probably occur in two weeks or less
PF 30	500R +	Yes	No**	More than 50%	Deaths would occur in about one month
PF 40 PF 60	375R + 250R +	Yes	No**	Less than 50%	Deaths would occur in 30 to 60 days
PF 80 PF 100 PF 200	188R + 150R + 75R +	No	Yes	Less than 5%	Deaths would occur in 60 or more days
PF 500	30R +	No	Yes	None	No symptoms

* Based on the lowest potential doses; at the practical upper limit of this area (approximately 100,000R dose), only shelter with a PF of 2000 or more can mitigate against probable illness and death.

** Except during illness-free latent period.

Survivors in an area of this type face the possibility of continuing to mitigate the radiation risk beyond 1-week in order to sustain life and health. Outdoor radiation levels in this area may still be high enough at the end of 1-week to severely limit outdoor activity and may require frequent and continued stay within shelter to limit additional exposures through the end of the first month. This longer in-shelter period and limited time for outdoor activity would require advance preparations to sustain life (stocking of food, water, sanitation equipment, etc.).

Chart B-3b. POTENTIAL LONG-TERM EFFECTS ON SURVIVORS IN VERY HIGH FALLOUT RISK AREAS*

Using Shelter Protection Factor	Potential In-Shelter One Week Dose Range	Additional Survivor Cancer Deaths	Additional Deaths From Genetic Damage in Future Generations
PF 5	3000R +	No survivors	No progeny
PF 10	1500R +		
PF 20	750R +		
PF 30	500R +	23 to 30%	2.6 to 3.5%
PF 40	375R +	15 to 23%	1.8 to 2.6%
PF 60	250R +		
PF 80	188R +	4.5 to 11%	.53 to 1.3%
PF 100	150R +		
PF 200	75R +		
PF 500	30R +	0 to 1.4%	0 to .21%

* Based on assumption that sheltered survivors receive an additional dose over the longer term equal to that received in shelter, i.e., double the shelter dose received in 1 week.

The very high PF ratings needed in this area are generally found only in buildings of massive construction, mines, caves, tunnels, and the like. These facilities would have to be prepared in advance for occupancy.

(3) Overview - The total potential Very High Fallout Risk Areas cover approximately 421,835 square miles of the U.S., with a resident population of 9.582 millions. This constitutes 12.1 percent of the total U.S. land area, and 4.2 percent of the national population.

b. High Fallout Risk

(1) Definition - A High Fallout Risk Area is defined as an area which has the potential to receive a 1-week total radiation dose of equal to or greater than 6,000R but less than 15,000R.

(2) Criteria - If the radiation levels that characterize a High Fallout Risk Area should occur, eventual death from radiation is almost certain for resident populations unless they find shelter with relatively high protection factors (PF's).

Charts B-4a and B-4b illustrate the consequences of selecting PF levels ranging from PF 5 through PF 500. It should be pointed out that exact radiation levels can never be determined for specific points within this area in advance of fallout arrival. Hence, a minimum PF level for the entire area cannot (and should not) be defined. Shelters with the highest PF possible should always be used in planning.

Chart B-4a. PROBABLE CONDITION OF MAJORITY OF SURVIVORS IN HIGH FALLOUT RISK AREAS*

Using Shelter Protection Factor	Potential In-Shelter One Week Dose Range	Medical Care Needed	Able to Work	Probable Death Rate	Comments
PF 5 PF 10 PF 20	1200R-3000R 600R-1500R 300R-750R	Yes	No	100%	Deaths would probably occur in two weeks or less
PF 30	200R-500R	Yes	No**	More than 50%	Deaths would occur in about one month
PF 40 PF 60	150R-375R 100R-250R	Yes	No**	Less than 50%	Deaths would occur in 30 to 60 days
PF 80 PF 100 PF 200	75R-188R 60R-100R 30R-75R	No	Yes	Less than 5%	Deaths would occur in 60 or more days
PF 500	12R-30R	No	Yes	None	No symptoms

* Based on the highest potential doses; further mitigation of illustrated conditions would occur at lower dose ranges.

** Except during illness-free latent period.

Chart B-4b. POTENTIAL LONG-TERM EFFECTS ON SURVIVORS IN HIGH FALLOUT RISK AREAS*

Using Shelter Protection Factor	Potential In-Shelter One Week Dose Range	Additional Survivor Cancer Deaths	Additional Deaths From Genetic Damage in Future Generations
PF 5 PF 10 PF 20	1200R-3000R 600R-1500R 300R-750R	No survivors	No progeny
PF 30	200R-500R	23 to 30%	2.6 to 3.5%
PF 40 PF 60	150R-375R 100R-250R	15 to 23%	1.8 to 2.6%
PF 80 PF 100 PF 200	75R-188R 60R-100R 30R-75R	4.5 to 11%	.53 to 1.3%
PF 500	12R-30R	0 to 1.4%	0 to .21%

* Based on assumption that sheltered survivors receive an additional dose over the longer term equal to that received in shelter, i.e., double the shelter dose received in 1 week.

Survivors in areas of this type may face the possibility of continuing mitigation of the radiation risk beyond 1 week in order to sustain life and health. Outdoor radiation levels could be high enough at the end of 1 week to place a limit on time for outdoor activities and may require continued use of the shelter to limit additional exposures through the end of the first month. The longer in-shelter period which may be required in this area would mean advance preparations to sustain life (stocking of food, water, etc.) are a necessary measure.

(3) Overview - The total potential High Fallout Risk Areas cover approximately 614,508 square miles of the U.S., with a resident population of 48.712 millions. This constitutes 18.0 percent of the total U.S. land area, and 21.3 percent of the national population.

c. Medium Fallout Risk

(1) Definition - A Medium Fallout Risk Area is defined as an area which has the potential to receive a 1-week unprotected radiation dose of equal to or greater than 3,000R but less than 6,000R.

(2) Criteria - If the fallout levels that characterize a Medium Fallout Risk Area should actually occur, death or debilitating illness from radiation is certain for resident populations without adequate shelter. Charts B-5a and B-5b illustrate the consequences of selecting PF

Chart B-5a. PROBABLE CONDITION OF MAJORITY OF SURVIVORS IN MEDIUM FALLOUT RISK AREAS*

Using Shelter Protection Factor	Potential In-Shelter One Week Dose Range	Medical Care Needed	Able to Work	Probable Death Rate	Comments
PF 5	600R-1200R	Yes	No	100%	Deaths would occur in two weeks or less
PF 10	300R-600R	Yes	No**	More than 50%	Deaths would occur in about one month
PF 20	150R-300R	Yes	No**	Less than 50%	Deaths would occur in 30 to 60 days
PF 30	100R-200R	No	Yes	Less than 5%	Deaths would occur in 60 or more days
PF 40	75R-150R				
PF 60	50R-100R				
PF 80	38R- 75R				
PF 100	30R-60R	No	Yes	None	No symptoms
PF 200	15R-30R				
PF 500	6R-12R				

* Based on the highest potential doses; further mitigation of illustrated conditions would occur at lower dose levels.

** Except during illness-free latent period.

levels ranging from PF 5 through PF 500. It should be pointed out that exact radiation levels can never be determined for specific points within this area in advance of fallout arrival. Hence, a minimum PF level for the entire cannot (and should not) be defined. Shelter with the highest PF possible should always be used in planning.

Chart B-5b. POTENTIAL LONG-TERM EFFECTS ON SURVIVORS IN MEDIUM FALLOUT RISK AREAS*

Using Shelter Protection Factor	Potential In-Shelter One Week Dose Range	Additional Survivor Cancer Deaths	Additional Deaths From Genetic Damage in Future Generations
PF 5	600R-1200R	No survivors	No progeny
PF 10	300R-600R	23 to 30%	2.6 to 3.5%
PF 20	150R-300R	15 to 23%	1.8 to 2.6%
PF 30	100R-200R	4.5 to 11%	.53 to 1.3%
PF 40	75R-150R		
PF 60	50R-100R		
PF 80	38R-75R		
PF 100	30R-60R	0 to 1.4%	0 to .21%
PF 200	15R-30R		
PF 500	6R-12R		

* Based on assumption that sheltered survivors receive an additional dose over the longer term equal to that received in shelter, i.e., double the shelter dose received in 1 week.

Survivors in this area may face the possibility of continuing to use shelters beyond 1 week in order to sustain life and health. Potential outdoor radiation levels may be moderately high enough at the end of 1 week to require careful area monitoring to limit additional exposure from outdoor activity. Continued use of shelter beyond 1 week following outdoor activity may also be required through the end of the first month and would require modest preparations to sustain life (stocking of food, water, etc.).

(3) Overview - The total potential Medium Fallout Risk Areas cover approximately 578,616 square miles of the U.S., with a resident population of 62.702 millions. This constitutes 16.9 percent of the total U.S. land area, and 27.4 percent of the national population.

d. Low Fallout Risk

(1) Definition - A Low Fallout Risk Area is defined as an area which has the potential to receive a 1-week unprotected radiation dose of less than 3,000R.

(2) Criteria - If the fallout levels that characterize a Low Fallout Risk Area should occur, debilitating illness and possible death are certain for resident populations without adequate shelter. Charts B-6a

and B-6b illustrate the consequences of selecting protection levels ranging from PF 5 through PF 500. It should be pointed out that exact radiation

Chart B-6a. PROBABLE CONDITION OF MAJORITY OF SURVIVORS IN LOW FALLOUT RISK AREAS*

Using Shelter Protection Factor	Potential In-Shelter One Week Dose Range	Medical Care Needed	Able to Work	Probable Death Rate	Comments
PF 5	600R or less	Yes	No**	More than 50%	Deaths would occur in about one month
PF 10	300R or less	Yes	No**	Less than 50%	Deaths would occur in 30 to 60 days
PF 20	150R or less	No	Yes	Less than 5% than	Deaths would occur in 60 or more days
PF 30	100R or less				
PF 40	75R or less				
PF 60	50R or less	No	Yes	None	No symptoms
PF 80	38R or less				
PF 100	30R or less				
PF 200	15R or less				
PF 500	6R or less				

* Based on the highest potential doses; further mitigation of illustrated conditions would occur at lower dose levels.

** Except during illness-free latent period.

Chart B-6b. POTENTIAL LONG-TERM EFFECTS ON SURVIVORS IN LOW FALLOUT RISK AREAS*

Using Shelter Protection Factor	Potential In-Shelter One Week Dose Range	Additional Survivor Cancer Deaths	Additional Deaths From Genetic Damage in Future Generations
PF 5	600R or less	23 to 30%	2.6 to 3.5%
PF 10	300R or less	15 to 23%	1.8 to 2.6%
PF 20	150R or less	4.5 to 11%	.53 to 1.3%
PF 30	100R or less		
PF 40	75R or less		
PF 60	50R or less	0 to 1.4%	0 to .21%
PF 80	38R or less		
PF 100	30R or less		
PF 200	15R or less		
PF 500	6R or less		

* Based on assumption that sheltered survivors receive an additional dose over the longer term equal to that received in shelter, i.e., double the the shelter dose.

levels can never be determined for specific points within this area in advance of fallout arrival. Hence, a minimum PF level for the entire area cannot (and should not) be defined. Shelter with the highest PF possible should always be used in planning.

Continued use of shelter in this type of area beyond 1 week might not be necessary. As a precaution, however, unnecessary outdoor work should be avoided until all necessary radiological monitoring and decontamination has been completed.

(3) Overview - The total potential Low Fallout Risk Area covers approximately 1,803,733 square miles of the U.S., with a resident population of 107.867 millions. This constitutes 52.8 percent of the total U.S. land area, and 47.1 percent of the national population.

C. Thermal and Secondary Blast Fire Risk

1. General Overview - This risk accompanies the direct effects risk discussed in A., above. There are two principal causes of fire in direct effects risk areas: primary fires ignited directly by the thermal pulse or "heat flash" of a nuclear detonation; and secondary fires started by blast effects damage on electrical connections, gas lines, heating units, etc.

About 35 percent of the energy of an air-burst nuclear weapon is released as thermal energy or "heat flash." In weapon yields in hundreds of kilotons the duration of this period of energy radiation is very short (a flash of light) and the heat from the fireball is translated almost instantly to the surrounding area. In larger weapons (a megaton or greater) the fireball is slower in forming and is of somewhat longer duration. Therefore, in large weapons, the heat from the fireball is prolonged in areas of high overpressure but is proportionally less than the energy transmitted at low overpressure distances by the smaller-yield weapons. (Note: for determination of the fire risk, NAPB-90 assumed weapon yields characteristic of the 1985-1990 strategic inventories, i.e., weapons in the 500 kiloton to 1.5 megaton range.)

Thermal energy is measured in the number of calories per square centimeter (abbreviated "cal/cm^2") delivered to exposed areas. A calorie is the amount of heat necessary to raise the temperature of 1 gram of water 1 degree Celsius. The rate at which the calories are transmitted over time is also an important aspect of ignition. For weapons characteristic of the NAPB-90 inventories, it was assumed that thermal energy of the explosion is delivered almost "instantaneously" to exposed areas, i.e., at a very high rate.

The extent of the thermal effect of a nuclear weapon is subject to natural variations in the atmospheric conditions as well as the shielding ("shadow") provided by adjacent buildings, trees, hills, and the like. Likewise, any windows facing away from the fireball would receive little or no thermal energy. In addition to shielding, atmospheric conditions (such as rain or fog) would markedly reduce the transmission of the thermal energy and, thus, subsequent primary fire starts. Even minor shielding can have a mitigating effect on the amount of heat transmitted beyond the shielding: ordinary window glass and screens can reduce heat transmission into a room by as much as 20 percent or more.

Secondary fires may result from the disruption of building furnaces, gas lines, electric lines, and the like, and are independent of those influences mentioned above affecting the number of primary fire starts, since secondary fires are generated by damage and destruction from blast overpressure.

All NAPB-90 discussions in this section on the risk of potential primary and secondary fires are based on the assumption of a nuclear weapon detonated at its optimum height of burst to maximize the area covered by a blast overpressure of 10.0 psi or more, and under clear weather conditions which allow a visibility of 10 miles or more.

2. Composition of the Fire Risk - Factors influencing the magnitude of the fire risk are:

- The type of blast damage within the area;
- The number of primary and secondary fires originating (and not suppressed) within the area;
- The density of construction of the fire area, usually defined as the fraction of ground covered by buildings;
- The number of buildings within the area which are burning at the same time (usually expressed as a percentage of buildings);
- The amount of immediate fuel available to the fire;
- The weather conditions at the time of burning; and,
- The season of the year.

An example of the relationship of these factors is presented below. It must be stressed that such examples are illustrative of the potential fire risk and are based upon certain assumptions of the factors influencing the magnitude of the fire risk. Emergency planning requires an assessment of the actual values of the factors which influence the fire potential of tracts within a Direct Effects Area. A comprehensive assessment can be conducted only by fire professionals who have a working knowledge of the technology of fire and who can define the "real-world" fire risk to an area. Fire risk definitions in NAPB-90 are illustrative of the potential risk and are not predictive.

a. Origination

(1) Relationship to Overpressure - There is close relationship between the level of blast overpressures from air-burst weapons and the thermal energy received at any given overpressure. For example, the rationale

designating 2.0 psi overpressure limit as the practical limit of major thermal-induced primary fires is based on the fact that for most air-burst weapons, the 2.0 psi boundary coincides with a delivered thermal energy about 12.0 cal/cm^2--approximately the level of energy at which nearly all exposed easily flammable substances would ignite. This relationship, however, does not hold true between low air-bursts and surface-bursts of the same weapon yield.

Although little research has been done at low overpressure ranges on levels of thermal energy transmission, it is almost certain that primary fire ignitions could occur within the entire area of 0.5 psi and greater overpressure.

The level of damage produced by certain blast overpressures can affect fire growth and spread. For example, damage from blast overpressures in the 2.0 to 5.0 psi range is generally characterized by damaged but standing buildings amid a debris field--conditions favoring the spread, growth, and severity of fire. On the other hand, blast overpressures above 5.0 psi tend to result in a large debris field within which fire spread and growth could be much slower, and the severity of fires could be less intense.

(2) Primary Fire Starts - For all easily flammable materials exposed ("unshielded") to the thermal flash, the possibility exists that a primary fire may start if the material:

- Receives sufficient calories per square centimeter at a sufficient rate (i.e., over a very short period of time);
- Is not extinguished by the following blast wave or by immediate fire suppression actions; and,
- Is collocated with other, "heavier" fuel to sustain the initial ignition.

Ignition of commonly found outdoor "trash"--such things as newspapers, cardboard cartons, dried leaves--will usually occur at relatively low thermal exposures (about 5 to 7 cal/cm^2). By themselves, however, these fuels rarely can generate a sustained fire. Of much greater concern are ignitions of materials most commonly found indoors where a thermal ignition of things like curtains or drapes may spread to other material within the room. The risk from primary ignitions is highest when both the "tinder" with which to begin the fire, and substantial, heavier fuel with which to provide for continued fire growth are present. While weapon testing has indicated that this type of fire rarely occurred below 2.0 psi overpressure, primary ignitions cannot be categorically ruled out for this area.

Table C-1 shows extrapolated weapons test data on the estimated primary fire starts which might be expected to occur in exposed rooms from an air-burst, 1.0 megaton weapon on a clear day. Note that primary fire starts below 2.0 psi could occur but are considered the exception.

Table C-1. Estimated Primary Fire Starts Per 1000 Exposed Rooms

Blast Overpressure	Fires in Commercial Buildings	Fires in Private Residences
0.5 psi	Possible but Rare	Possible but Rare
1.0 psi	Probably None	Probably None
2.0 psi	Approximately 1%	Less than 1%
3.0 psi	Approximately 20%	Approximately 10%
5.0 psi	Approximately 38%	Approximately 21%

Some visual evidence suggested at Hiroshima and Nagasacki that the blast wave which followed thermal radiation may have extinguished some primary ignitions (although no firm proof was found to support this assumption). However, subsequent shock tunnel tests of room fires similar to primary ignitions seemed to suggest that some proportion of primary fires will be extinguished by the blast wave and it will slow, but not stop, fire growth.

(3) Secondary Ignitions - As stated earlier, the damage and destruction of the blast wave can create secondary fires from a variety of causes. At Hiroshima, for example, a great number of fires were caused by the overturning of hot charcoal cooking braziers commonly found in Japanese homes.

Secondary fires present a potential risk regardless of local weather conditions which might inhibit primary ignitions and could also be more extensive in the case of ground-burst weapons. Advance preparations (such as shutting off electrical power and gas supplies) could significantly reduce, but probably not eliminate, secondary fires.

Studies and research suggest that statistically in the area receiving 2.0 psi to 5.0 psi overpressure up to six significant secondary fire starts might be expected for every million square feet of building floor space. In a predominantly residential area, however, the number of such starts might be half as many. Theoretically, this assessment suggests an important functional relationship between the degree of blast damage and potential secondary fire starts.

b. Growth - As noted previously, there are a number of factors which influence fire growth. These are discussed below in illustrative applications of fire growth factors of various combinations. The potential growth of individual fires into large group or mass fires, as well as "firestorms," is also discussed. In the example presented, influences of weather and the season of the year on the growth and severity of fire are not factored.

(1) Area Density - Probably one of the most important factors influencing fire growth and severity is the amount of open space between construction in a given area. This is usually expressed as the percent of land area which is under roof (streets, parks, parking lots, yards, and the like, are considered open space). Suburban single family residential areas,

for example, typically are 20 percent or less "built up," while an inner city tenement district may be built up 50 percent or more.

Table C-2 shows illustrative area coverages for some types of construction.

Table C-2. Illustrative Area Coverage

General Type of Area Construction	Illustrative Area Covered by Buildings[1/]
Tenement/Townhouse	10 to 50 percent
Industrial	20 to 40 percent
High Rise Commercial	20 to 40 percent
Public Use Buildings	20 to 40 percent
Apartments (Fire Resistant)	10 to 25 percent
Warehousing/Storage	10 to 25 percent
Industrial Park	Up to 25 percent
Single Homes (All Types)	Up to 20 percent

[1/] Percent of square mile covered by roof

The less open space between burning buildings, the more likely that fires will spread to buildings not previously ignited. Spread is achieved by three means of energy transfer: convection, radiation, and firebrands.

- Convection raises the temperature of nearby combustibles by the contact of flame or hot gases and is most likely to occur when buildings are immediately adjacent or very close to each other, as in a highly built-up area.

- Radiation from a burning structure raises the temperature of nearby combustibles in a manner similar to the thermal radiation of the weapon but at a very much lower rate.

- Firebrands from a burning building when carried aloft by wind or hot air convection currents can cause ignitions in other buildings and in other combustible material (such as debris) over a wide, downwind area.

It is not known how fire spreads in large debris fields with little or no structures standing.

(2) Simultaneous Burning - Another important influence on the growth and severity of fires is the number of standing buildings burning at the same moment within the area. Usually this is expressed as the percentage of total buildings within a square mile which are burning simultaneously. The importance of this influence was demonstrated in World War II and subsequently verified by controlled fire experiments.

(3) Fuel Load - The fuel in a building is measured in pounds of combustible material per square foot of floor space. This figure would represent the combined fuel of a building and its contents. For example, the fuel load of the contents of a single family residence might average

about 3.5 pounds per square foot of floor, while the combined fuel load of both contents and building might be 10 to 20 pounds or more per square foot for each floor of the structure.

The heat of combustion of the fuel is measured in kilowatt hours per pound of fuel. Each pound of available, burned fuel can be expected to release about 2.3 kilowatt-hours of energy (although many synthetic substances have a higher potential for energy release).

Table C-3 shows illustrative ranges of fuel loading for various types of building construction.

Table C-3. Illustrative Ranges of Fuel Loading

General Type of Area Construction	Illustrative Fuel Load Per Square Foot, Per Floor*
Warehousing/Storage	20 to 80 pounds
High Rise Commercial	10 to 40 pounds
Tenement/Townhouse	10 to 30 pounds
Industrial	5 to 30 pounds
Industrial Park	10 to 30 pounds
Frame or Brick Single Homes	10 to 20 pounds
Public Use Buildings	5 to 10 pounds
Single Homes (Fire Resistant)	5 to 10 pounds
Apartments (Fire Resistant)	3 to 5 pounds

*Building and sum of contents

c. Severity - Predicting the severity of fires is an uncertain science despite extensive research on World War II mass fires which occurred in German and Japanese cities. Some of the very large mass fires called "firestorms" by a German journalist had characteristics which were new to previous fire experience. In broad qualitative terms, fire research and study of the firestorm events following attacks on Heilbronn, Hamburg, Dresden, and Darmstadt, Germany, show that a firestorm event is accompanied by:

- High-velocity, in-rushing winds at the periphery of the fire area;
- A well-developed convection or smoke column; and,
- Little spread beyond the area containing the initial, merged fires.

Research also indicated that large fires, including firestorm events, will not develop without adequate fuel within the area of initial fires, coupled with a very high rate of fuel consumption. Most importantly, the studies showed that the level of damage from high-explosive bombs used before incendiary bombs played a significant role in the formation of the firestorm. The damage environment created was conducive to the rapid burning which took place. Four basic criteria were determined to be present in the firestorm events listed above. In each of these events:

- The average fuel loading per square foot of the entire fire area was at least 8 pounds (buildings and their contents);

- At least half of the standing, damaged buildings within the area were burning simultaneously and vigorously within a short time following initial fire starts;

- Initial surface winds at the time of the attack were less than 8 miles per hour; and,

- The firestorm area was greater than 0.5 square miles.

Illustrative examples on severity given below will address all of these criteria except weather (which is assumed to be "ideal").

(1) Relationship to Overpressures - As stated earlier, there is a close relationship between blast overpressure levels and characteristics which seem to replicate the German firestorm experiences. But while mass fire experiments in the 1960's tended to confirm much of the criteria for a firestorm occurrence (particularly those dealing with fuel consumption and burn rate), it is not at all clear whether fires in a nuclear effects environment would develop in the same manner.

Weapon test data show that buildings within the 2.0 to 5.0 psi overpressure range of a nuclear weapon would generally be heavily damaged but standing. Portions of this blast area might include certain of the necessary requirements for the generation of a firestorm. On the other hand, damage in the area experiencing 5.0 psi and more overpressure would be more severe with few buildings remaining standing. This area could be expected to consist largely of rubble and debris from destroyed buildings and their contents. Here, the necessary criteria for mass fires or firestorms may not be present (which is not to say that fires could not occur).

(2) Burn Time - Fire can be said to have three burn stages--all related to time: initial ignition; vigorous burning, when a large amount of the fuel energy is expended; and residual burning, which consumes the remaining fuel. Of the three, vigorous burning is the most important in determining the severity of fires following a nuclear detonation since it usually occurs over a relatively shorter period of time than the growth and residual stages. While not totally adequate as a measure, the vigorous burn stage can be used to define a burn "rate" for comparative purposes.

Weapon tests as well as research have shown that the vigorous burn stage of a damaged but standing structure generally releases a higher proportion of the available energy than the vigorous burn stage of rubble or debris of the same fuel density.

Table C-4 shows illustrative vigorous burn rates for various types of area construction for both damaged and destroyed building modes.

Table C-4. Illustrative Vigorous Burn Rates

General Type of Area Construction	Damaged Buildings[1/] Energy Released Over Time	Damaged Buildings Percent of Fuel	Damaged Buildings Burn Rate[3/]	Rubble and Debris[2/] Energy Released Over Time	Rubble and Debris Percent of Fuel	Rubble and Debris Burn Rate[3/]
Frame or Brick Single Homes	20 min	70%	2.10	40 min	75%	1.13
Single Family (Fire Resistant)	20 min	70%	2.10	40 min	75%	1.13
Tenement/Townhouse	25 min	60%	1.44	50 min	70%	.84
Apartments (Fire Resistant)	25 min	60%	1.44	50 min	70%	.84
Warehousing/Storage	40 min	60%	.90	80 min	70%	.53
High Rise Commercial	40 min	60%	.90	80 min	70%	.53
Industrial	60 min	30%	.30	60 min	30%	.30
Industrial Park	60 min	30%	.30	60 min	30%	.30
Public Use Buildings	60 min	30%	.30	60 min	30%	.30

[1/] Damage characteristic in Medium Direct Effects Risk Areas (2.0 to 5.0 psi).

[2/] Damage characteristic in High and Very High Direct Effects Risk Areas (greater than 5.0 psi).

[3/] Relative burn rate given by the fraction of the available energy released per hour of vigorous burn time.

(3) Potential Energy - Previous illustrations concerning area coverage of various types of construction and corresponding fuel loads gave high-low ranges for these figures. To simplify further discussion, potential energies will be determined using only the high ranges of illustrative figures previously shown. Potential energies will be calculated for both the areas identified in Table C-4., above.

The severity of mass fire is expressed in terms of the average energy output per hour of vigorous burn time measured in millions of kilowatts of energy per square mile of fire area.

Table C-5 shows illustrative energies for various types of construction. Note that to determine such potential energy, it is necessary to assume an average number of stories for buildings in each category of construction. Fire severity assessments for specific areas require estimates based on the composition of construction in these areas.

Table C-5. Illustrative kW Energy (Millions) in Construction

General Type of Area Construction	Ave Sty[1]	Area Cvrg[2]	Fuel Load[3]	Millions kW Energy Per: Sq Ft	Bldg	Sq Mile
High Rise Commercial	6	40%	40 lbs	94 kW	564 kW	6263 kW
Tenement/Townhouse	3	50%	30 lbs	141 kW	423 kW	2936 kW
Warehousing/Storage	2	25%	80 lbs	117 kW	235 kW	2610 kW
Industrial	2	40%	30 lbs	240 kW	47 kW	1566 kW
Public Use Buildings	4	40%	10 lbs	8 kW	31 kW	1044 kW
Industrial Park	2	25%	30 lbs	15 kW	29 kW	979 kW
Frame or Brick Homes	1.5	20%	20 lbs	55 kW	55 kW	392 kW
Apartments (Fire Res)	3	25%	5 lbs	12 kW	35 kW	245 kW
Single Homes (Fire Res)	1.5	20%	10 lbs	27 kW	41 kW	190 kW

[1] Assumed average height (stories) of all buildings in the area.

[2] Highest illustrative square mile area coverage by roof.

[3] Highest illustrative per square foot fuel load for building and contents.

To obtain an average rate of kilowatt energy release per hour per square mile, the burn rate for each type of construction must be considered.

Carrying over data illustrated in Table C-5, Table C-6a illustrates the potential kilowatt energy in a Medium Direct Effects Risk Area (2.0 to 5.0 psi overpressure) assuming 100 percent of the damaged, standing buildings are burning simultaneously at a vigorous burn rate, an extremely unlikely situation.

Table C-6a. Illustrative Energy Release With All Buildings Burning in Medium Direct Effects Risk Area (2.0 to 5.0 psi)

General Type of Area Construction	Millions of kW Potential Sq Mile Energy[1]	Burn Rate	Millions of kW Energy Release Per Sq Mile[2]
High Rise Commercial	6263 kW	.90	5736 kW
Tenement/Townhouse	2936 kW	1.43	4198 kW
Warehousing/Storage	2610 kW	.90	2349 kW
Frame or Brick Single Homes	392 kW	2.12	831 kW
Industrial	1566 kW	.30	470 kW
Single Homes (Fire Resistant)	196 kW	2.12	416 kW
Apartments (Fire Resistant)	245 kW	1.43	350 kW
Public Use Buildings	1044 kW	.30	313 kW
Industrial Park	979 kW	.30	294 kW

[1] All buildings; data carried from Table C-5.

[2] Potential average rate of kW energy per square mile (in millions of kW) if all buildings in the area are in vigorous burn stage.

Table C-6b illustrates the same calculations of potential energy release in kilowatts in the High and Very High Direct Effects Risk Areas (greater than 5.0 psi overpressure) if 100 percent of the rubble and debris from this construction are burning simultaneously at a vigorous burn rate, again, an extremely unlikely situation.

Both Table C-6a and C-6b will serve as a base for determining the average kilowatt energy release for more realistic assumptions of the numbers of buildings in simultaneous, vigorous burn stages which will allow an assessment of the possibility of mass fire or firestorm events.

Table C-6b. Illustrative kW Energy With Simultaneous Rubble and Debris Burning in High and Very High Direct Effects Risk Area (greater than 5.0 psi)

General Type of Area Rubble or Debris	Millions of kW Potential Sq Mile Energy[1]	Burn Rate	Millions of kW Energy Release Per Sq Mile[2]
High Rise Commercial	6244 kW	.53	3309 kw
Tenement/Townhouse	2940 kW	.83	2440 kW
Warehousing/Storage	2604 kW	.53	1380 kW
Industrial	1568 kW	.30	470 kW
Frame or Brick Single Homes	392 kW	1.14	447 kW
Public Use Buildings	1036 kW	.30	311 kW
Industrial Park	980 kW	.30	294 kW
Single Family (Fire Resistant)	196 kW	1.14	223 kW
Apartments (Fire Resistant)	252 kW	.83	209 kW

1/ All rubble and debris from buildings.

2/ Potential average energy release in millions of kW per square mile if all rubble and debris from buildings are in vigorous burn stage.

(4) Mass Fire/Firestorm Potential - Analyses of World War II mass fires concluded that the severity of fires can be expressed as an average kilowatt energy release per square mile of fire area. Many such fires were classified as group fires since the area covered by the conflagration was characterized by isolated city blocks burning simultaneously and vigorously but not merging. Group fires of this kind were estimated to generate energy releases of from 25 to 300 million kilowatts. Included in this category were the fires which followed the atomic bomb attacks on Hiroshima and Nagasaki. While extremely dangerous to life, the severity of fires in both of these cities was less than that generated by conventional bombing in the Tokyo fire raids carried out some weeks before the dropping of the atomic bombs.

The chief factors involved in estimating potential fire severity have been covered before and will not be repeated here. An illustration of the effect of these factors is, however, pertinent. The Hamburg firestorm event provides an example case:

- The average fuel load of the area (including all buildings and contents and considering the density of construction) was estimated to be 70 pounds per square foot of fire area. At 2.3 kilowatt-hours per pound this translated into 163 potential kilowatt-hours per square foot or about 4567 million kilowatt-hours per square mile.

- It was estimated that about 45 percent of the buildings were in a vigorous burn stage simultaneously during the firestorm; therefore, about 2055 million kilowatt-hours were released per square mile of burn area.

- The firestorm lasted about three hours and, therefore, the hourly average release was about 676 million kilowatt-hours.

From the above, an estimate of the possibility of a firestorm would be a combination of contributing factors which could lead to an average energy release of at least 650 million kilowatt-hours or more per square mile. However, potential energy releases lower than this level have also been shown to be extremely dangerous. Estimates derived from large burn tests show that extreme life-threatening situations can develop from a combination of extremely high air temperatures, smoke and combustion-generated gases, and the rapid rise in carbon monoxide when the average energy release approaches 300 million kilowatt-hours per square mile. Fatality rates also increase sharply as this level is approached.

Table C-7a illustrates the changes in per square mile energy release rates when various percentages of buildings are burning simultaneously within the Medium Direct Effects Threat Area (2.0 to 5.0 psi). Likewise, Table C-7b illustrates the changes in per square mile energy release rates when various percentages of building rubble and debris are burning simultaneously within the High and Very High Direct Effects Threat Areas (greater than 5.0 psi).

Table C-7a. Illustrative Results of Simultaneous Burning in Medium Direct Effects Risk Area (2.0 to 5.0 psi)

General Type of Area Construction	Average Square Mile Rate of Energy Release (Millions of kW) 50% Burning	40% Burning	30% Burning	20% Burning
High Rise Commercial	2819 kW*	2255 kW*	1691 kW*	1127 kW*
Tenement/Townhouse	2099 kW*	1679 kW*	1259 kW*	840 kW*
Warehousing/Storage	1175 kW*	940 kW*	705 kW*	470 kW*
Frame or Brick Single Homes	416 kW**	332 kW**	249 kW	166 kW
Industrial	235 kW	188 kW	141 kW	94 kW
Single Family (Fire Resistant)	208 kW	166 kW	125 kW	83 kW
Apartments (Fire Resistant)	175 kW	140 kW	105 kW	70 kW
Public Use Buildings	157 kW	125 kW	94 kW	63 kW
Industrial Park	147 kW	118 kW	88 kW	59 kW

* Firestorm theoretically possible at this average energy release rate given all previous illustrative assumptions on fuel, coverage, average stories, and burn rate.

** Level of energy release would make area extremely dangerous for survivors.

Table C-7b. Illustrative Results of Simultaneous Burning in High and Very High Direct Effects Risk Areas (greater than 5.0 psi)

General Type of Area Construction	Average Square Mile Rate of Energy Release (Millions of kW)			
	50% Burning	40% Burning	30% Burning	20% Burning
High Rise Commercial	1644 kW*	1315 kW*	986 kW*	658 kW**
Tenement/Townhouse	1233 kW*	986 kW*	740 kW*	493 kW**
Warehousing/Storage	685 kW*	548 kW**	411 kW**	274 kW
Industrial	235 kW	188 kW	141 kW	94 kW
Frame or Brick Single Homes	221 kW	176 kW	132 kW	88 kW
Public Use Buildings	157 kW	125 kW	94 kW	63 kW
Industrial Park	147 kW	118 kW	88 kW	59 kW
Single Homes (Fire Resistant)	113 kW	90 kW	68 kW	45 kW
Apartments (Fire Resistant)	103 kW	82 kW	62 kW	41 kW

* A firestorm is theoretically possible at this energy release rate given all previous illustrative assumptions on fuel, coverage, average stories, and burn rate.

** The level of energy release would make this area extremely dangerous for survivors.

3. Statistical Overview of Risk - NAPB-90 defines the potential risk from fire following a nuclear explosion as the total area covered by blast overpressure, i.e., any area which has the potential to experience 0.5 pounds per square inch (psi) or more. This represents 727,112 square miles of U.S. territory with an estimated resident population of 175.11 millions.

The magnitude of this risk is represented in Annex A.

4. Methodology Employed - NAPB-90 defines three levels of potential risk from fire. Each definition is driven by the likely effects of the potential fire on the life and health of the resident population. In this context, the following considerations were used in determining the degrees of fire risk:

- The potential long-term severity of the threat to survivors within a blast-damaged area through entrapment in damaged or destroyed buildings by fires of whatever origin and of whatever severity; and,

- The kind, degree, and practicality of fire suppression actions.

It should be evident from prior discussions that there must be many factors present before mass fire or firestorm can result. If, in the entire area, such factors are not found to be present following a detailed fire assessment, the defined risks will be less severe than presented below.

The defined NAPB-90 fire risks, therefore, do not predict the severity or extent of the threat itself but do point out the potential for the risk to occur _if_ necessary factors in the entire area (or in portions of the area) support such a conclusion.

a. _Very High Fire Risk_

(1) _Definition_ - A Very High Fire Risk Area is defined as the area corresponding to the High and Very High Direct Effects Risk Areas, i.e., the area which has the potential to experience blast overpressures from a nuclear detonation equal to or greater than 5.0 psi.

(2) _Criteria_ - In a Very High Fire Risk Area survivors would probably face life-threatening fires generated by the thermal pulse of a weapon as well as damage-caused ignitions from ruptured gas and electric lines. In this area, it will be virtually impossible to initiate fire-fighting procedures because of rubble and debris, severed waterlines, damaged or destroyed firefighting equipment, and the like. For this reason--more than for the potential severity of fires--any survivors of blast effects face death unless evacuated from this area.

In short, residents in potential Very High Fire Risk Areas face extremely dangerous blast overpressures as well as the possibility of death from ensuing fires of whatever origin or severity.

(3) _Overview_ - The total potential Very High Fire Risk Areas in the U.S. cover approximately 96,248 square miles, with a resident population of 79.44 millions. Of the total U.S. area and population defined by NAPB-90 as under fire risk, 2.7 percent of the land area and 45.4 percent of the population fall under this risk definition. As a population group, those in Very High Fire Risk Areas represent 42.9 percent of the total population of the U.S.

b. _High Fire Risk_

(1) _Definition_ - A High Fire Risk Area is defined as the area corresponding to the Medium Direct Effects Risk Area, i.e., the area which has the potential to experience blast overpressures from a nuclear detonation equal to or greater than 2.0 psi but less than 5.0 psi.

(2) _Criteria_ - A High Fire Risk Area has the potential to experience large fires following weapon detonation which could prove fatal to survivors unless they were evacuated. The potential for such fires to originate and develop depends on the number of structures and construction type within the area and their propensity to fire growth and spread. Should a detailed fire analysis of this area reveal such characteristics, large group fires and even firestorms are possible, posing the possibility of sure death for survivors unable to evacuate the area.

Initial and subsequent firefighting procedures for large fires in this area will be difficult, if not impossible, due to limited mobility imposed by rubble and debris, the potential lack of water, and damaged or destroyed fire-fighting equipment. Self-help fire fighting of initial ignitions (from whatever cause) may be possible but extremely difficult.

(3) Overview - The total potential High Fire Risk Areas in the U.S. cover approximately 151,535 square miles, with a resident population of 50.3 million. Of the total U.S. area and population defined by NAPB-90 as under fire risk, 4.3 percent of the land area and 28.7 percent of the population fall under this risk definition. As a population group, those in High Fire Risk Areas represent 20.8 percent of the total population of the U.S.

c. Medium Fire Risk

(1) Definition - A Medium Fire Risk Area is defined as the area corresponding to the Low Direct Effects Risk Area, i.e., the area which has the potential to experience blast overpressures from a nuclear detonation equal to or greater than 0.5 psi but less that 2.0 psi.

(2) Criteria - The most probable cause of fire in a Medium Fire Risk Area will be from indoor primary ignitions caused by the thermal radiation of the weapon. These indoor ignitions, if unchecked, have the potential to grow into larger, more threatening fires. Secondary fires in this area are possible, but not very likely. Since protective measures in this area can be effective against blast overpressures, firefighting in this area is possible (if extensive preattack preparations and training have been accomplished), but shortages or lack of water for such purposes may prove a serious problem.

Fires in this area, even though individually intense, will probably not merge into a mass fire or firestorm.

(3) Overview - The total potential Medium Fire Risk Areas in the U.S. cover approximately 479,329 square miles, with a resident population of 45.37 millions. Of the total U.S. area and population defined by NAPB-90 as under fire risk, 13.5 percent of the land area and 25.9 percent of the population fall under this risk definition. As a population group, those in Medium Fire Risk Areas represent 18.8 percent of the total population of the U.S.

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Annex A
Direct Effects & Fire Risk Statistics & Maps

ANNEX A -- DIRECT EFFECTS & FIRE RISK

This Annex provides two summaries of the Direct Effects and Fire Risks to the U.S. resident population and land area.

PART 1. POPULATION GRID FILE (PGF) MAPS AND DATA

This part shows actual resident population and land area at risk from direct effects and fire as computed from PGF data. For a discussion of the methodology employed to obtain this data see Part 1, "Project Overview". This data is presented in regional summaries and computer-generated State map plots of PGF points showing blast overpressure and coexistent fire risk envelopes beginning on the pages following.

PART 2. HIGHEST DIRECT EFFECTS RISK BY COUNTY

This part, which begins on page A-81, shows county resident population and land area under direct effects risk based upon the highest recorded risk level within the county regardless of actual area covered by blast. This summary also includes counties which are "risk free", i.e., counties where blast overpressures were less than 0.5 psi.

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NATIONAL DIRECT EFFECTS & FIRE RISK SUMMARY

REGION/DATA	TOTALS	VERY HIGH GT 10 psi	HIGH 5 to 10 psi	MEDIUM 2 to 5 psi	LOW .5 to 2 psi	NONE LT .5 psi
I Population	12320207 (1.00)	2896912 (.23)	1597471 (.13)	2539876 (.21)	3085258 (.25)	2200690 (.18)
Land Area	61682 (1.00)	1772 (.03)	1751 (.03)	4830 (.08)	14922 (.24)	38407 (.62)
II Population	28524821 (1.00)	6216782 (.23)	5247384 (.18)	7174415 (.25)	5002208 (.18)	4684032 (.17)
Land Area	58436 (1.00)	1931 (.03)	2418 (.04)	6496 (.11)	27594 (.47)	27594 (.47)
III Population ...	25107876 (1.00)	5561771 (.22)	3826977 (.15)	5290161 (.21)	5591624 (.23)	4837343 (.19)
Land Area	120550 (1.00)	4047 (.03)	4480 (.04)	14176 (.12)	41433 (.34)	56415 (.47)
IV Population	42442705 (1.00)	5767158 (.16)	3985872 (.09)	6856991 (.16)	8190581 (.19)	17642103 (.42)
Land Area	379046 (1.00)	4788 (.01)	6069 (.02)	21348 (.06)	83971 (.22)	262888 (.69)
V Population	45687087 (1.00)	7118361 (.16)	5517272 (.12)	9692910 (.21)	9307723 (.20)	14050821 (.31)
Land Area	323545 (1.00)	4465 (.01)	5512 (.02)	18219 (.06)	69267 (.21)	226082 (.70)
VI Population	28140362 (1.00)	4692255 (.17)	3674256 (.13)	5871072 (.21)	5250122 (.19)	8652657 (.31)
Land Area	548583 (1.00)	4703 (.01)	5348 (.01)	19637 (.04)	80016 (.15)	439536 (.80)
VII Population ...	11925241 (1.00)	1818840 (.15)	1021635 (.09)	1827679 (.15)	1931387 (.16)	5325700 (.45)
Land Area	282971 (1.00)	4671 (.02)	4713 (.02)	13463 (.05)	31919 (.11)	227857 (.81)
VIII Population ..	7709731 (1.00)	1746086 (.23)	1061814 (.14)	1184503 (.15)	1143293 (.15)	2574035 (.33)
Land Area ...	573497 (1.00)	14118 (.02)	14208 (.02)	34450 (.06)	60495 (.11)	450246 (.79)
IX Population	31504342 (1.00)	9874143 (.31)	5447048 (.17)	8475761 (.27)	3917593 (.12)	3789797 (.09)
Land Area	386970 (1.00)	4518 (.01)	3883 (.01)	13087 (.03)	50440 (.13)	323363 (.84)
X Population	8634750 (1.00)	1553869 (.18)	808164 (.09)	1390051 (.16)	1949326 (.23)	933340 (.34)
Land Area	815946 (1.00)	364 (xxx)	1514 (xxx)	5829 (.01)	26869 (.03)	780370 (.96)
TOTAL Population .	242109419 (1.00)	47246177 (.20)	32187893 (.13)	50303419 (.21)	45369115 (.19)	66690518 (.27)
Land Area ..	3551226 (1.00)	46352 (.01)	49896 (.01)	151535 (.04)	479329 (.13)	2832758 (.80)

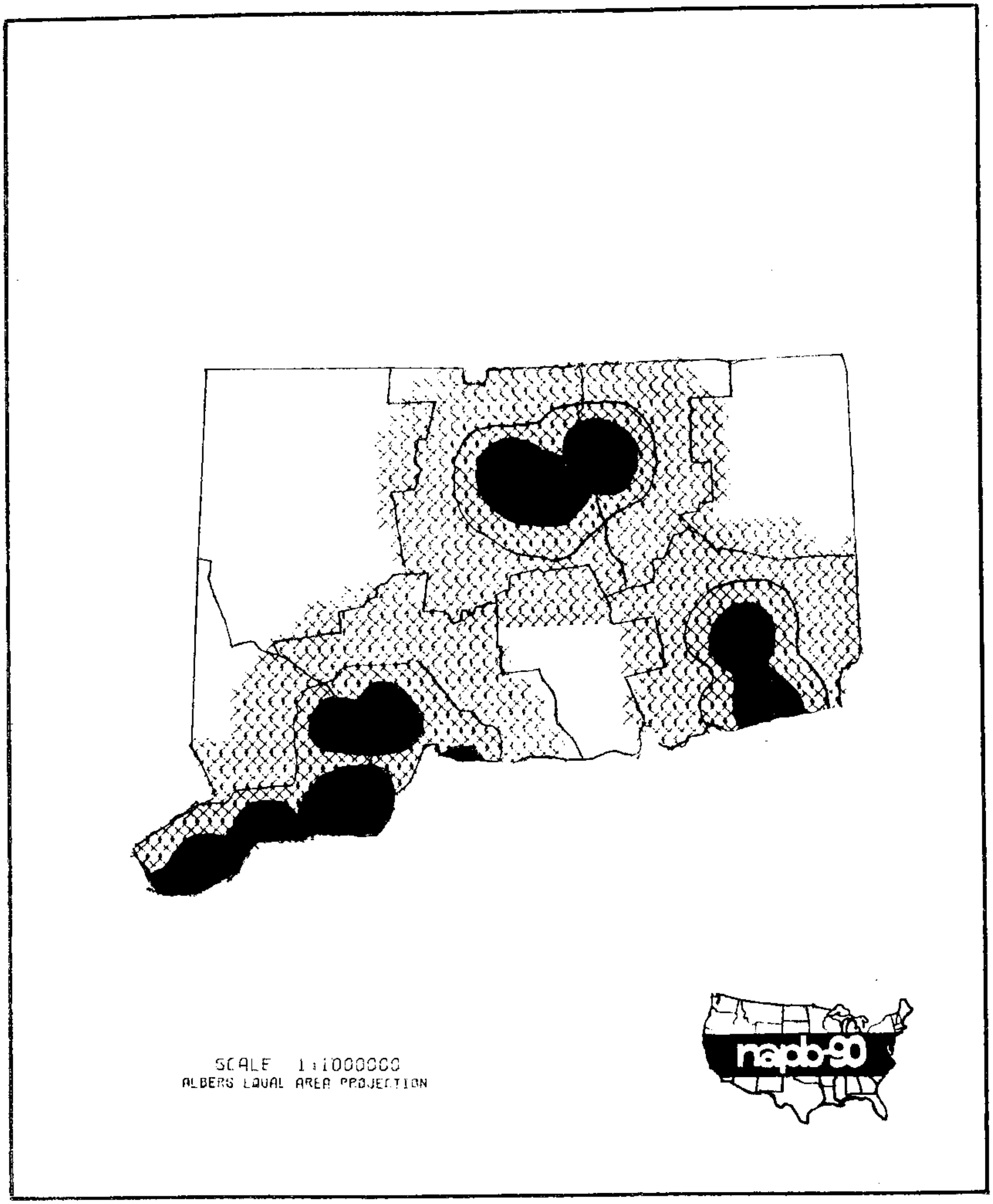
(xxx) Less than 1 percent

FEMA REGION I -- DIRECT EFFECTS & FIRE RISK

STATE/DATA		TOTALS	VERY HIGH GT 10 psi	HIGH 5 to 10 psi	MEDIUM 2 to 5 psi	LOW .5 to 2 psi	NONE LT .5 psi
CONNECTICUT	Population	3165461 (1.00)	699055 (.22)	385023 (.12)	1061179 (.33)	30981 (.01)	285635 (.09)
	Land Area	4872 (1.00)	439 (.09)	434 (.09)	1259 (.26)	2745 (.56)	-5 (N/A)*
MAINE	Population	1160878 (1.00)	147069 (.13)	60895 (.05)	123388 (.10)	284644 (.24)	544882 (.47)
	Land Area	30995 (1.00)	233 (.01)	307 (.01)	1068 (.03)	4602 (.15)	24785 (.80)
MASSACHUSETTS	Population	5503475 (1.00)	1695805 (.31)	919397 (.17)	1159268 (.21)	1231466 (.22)	497559 (.09)
	Land Area	6497 (1.00)	799 (.12)	661 (.10)	1603 (.25)	4332 (.67)	-898 (N/A)*
NEW HAMPSHIRE	Population	990437 (1.00)	123897 (.12)	86061 (.09)	162657 (.16)	203258 (.20)	414564 (.42)
	Land Area	8992 (1.00)	116 (.01)	164 (.02)	392 (.04)	1545 (.17)	6775 (.75)
RHODE ISLAND	Population	965471 (1.00)	208537 (.21)	186688 (.19)	362265 (.37)	259704 (.20)	--- (.00)
	Land Area	1054 (1.00)	164 (.16)	164 (.16)	439 (.42)	287 (.27)	--- (.00)
VERMONT	Population	534485 (1.00)	22549 (.02)	27407 (.06)	28710 (.06)	45007 (.09)	410812 (.75)
	Land Area	9272 (1.00)	21 (xxx)	21 (xxx)	69 (.01)	545 (.06)	8616 (.93)
REGION I	Population	12320201 (1.00)	2896912 (.23)	1597471 (.13)	2539876 (.21)	3085258 (.25)	2200684 (.18)
	Land Area	61682 (1.00)	1772 (.03)	1751 (.03)	4830 (.08)	14922 (.24)	38047 (.62)

*[NOTE: Anomaly caused by State resource grid points overlapping the State boundaries.]

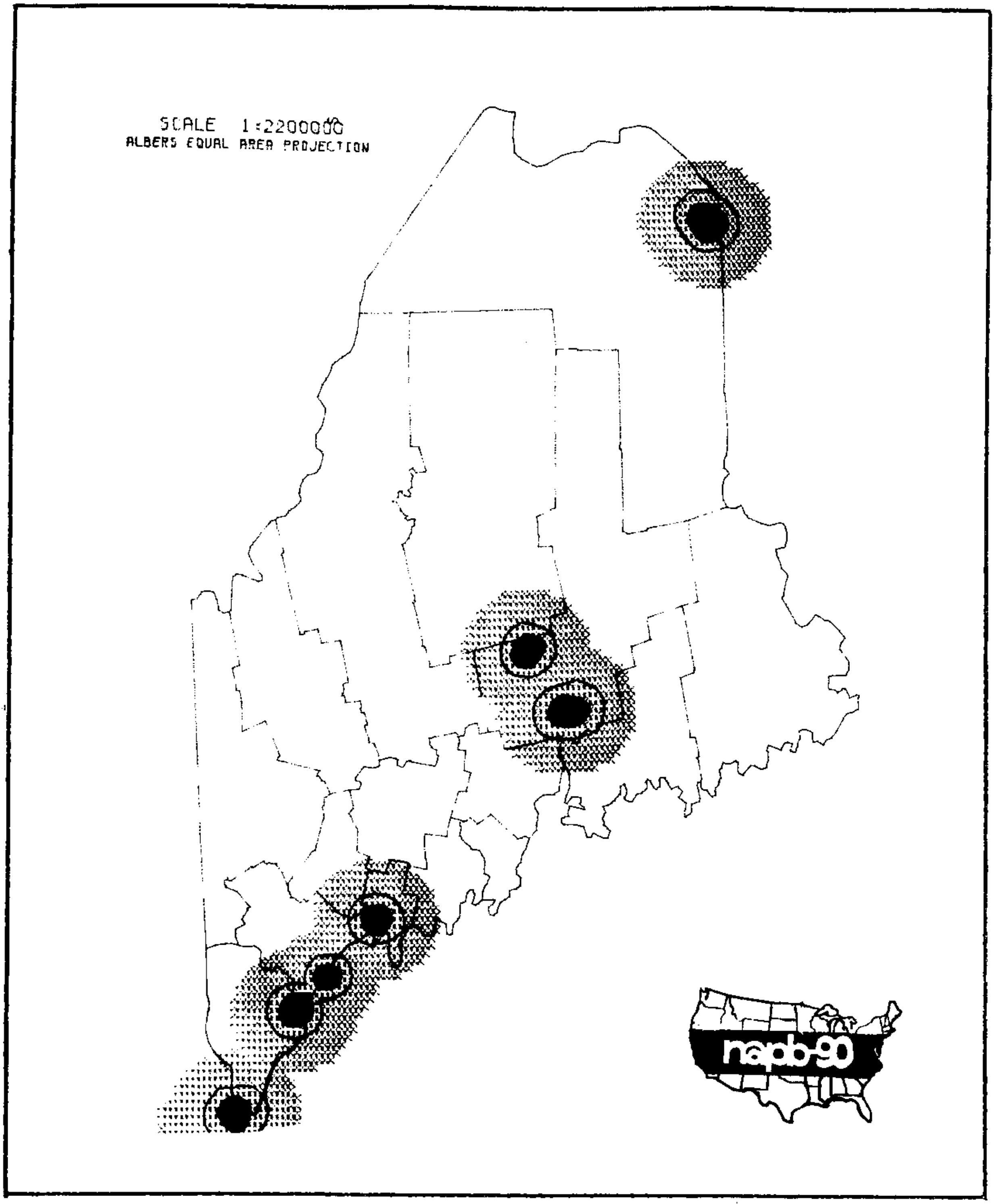
(xxx) Less than 1 percent



DIRECT EFFECTS RISK AREAS

FEMA REGION I - CONNECTICUT

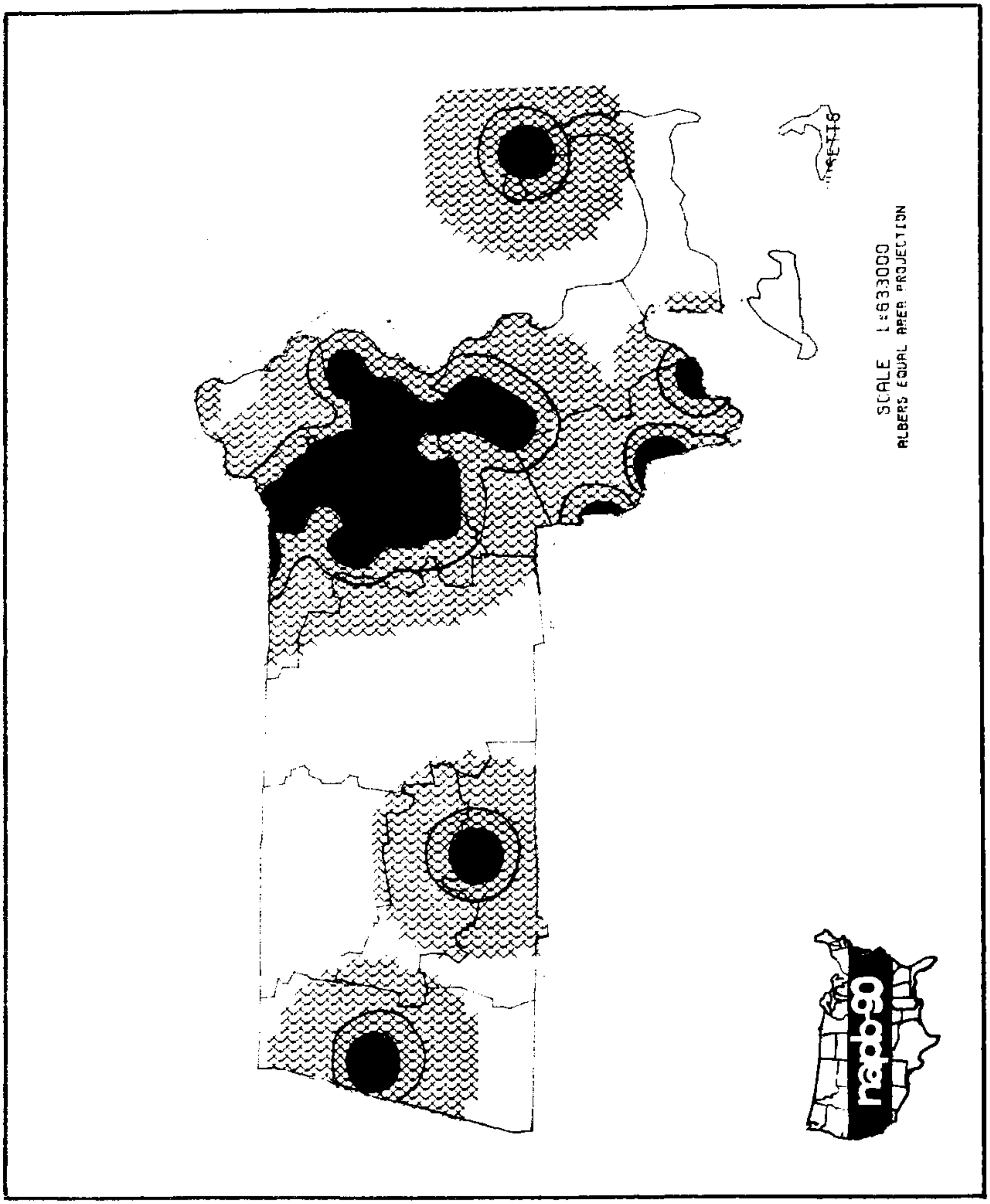
Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION I - STATE OF MAINE

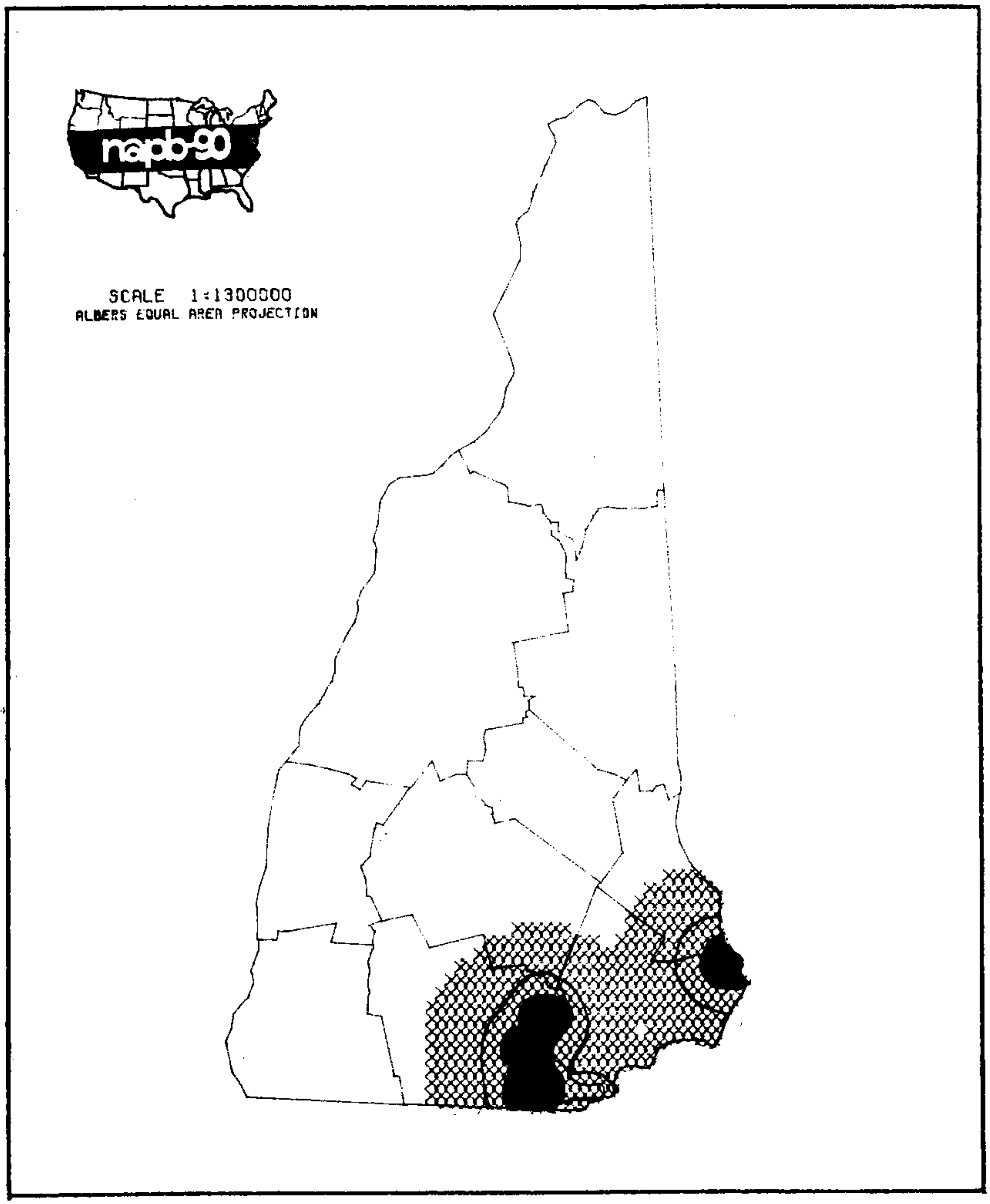
Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION I - MASSACHUSETTS

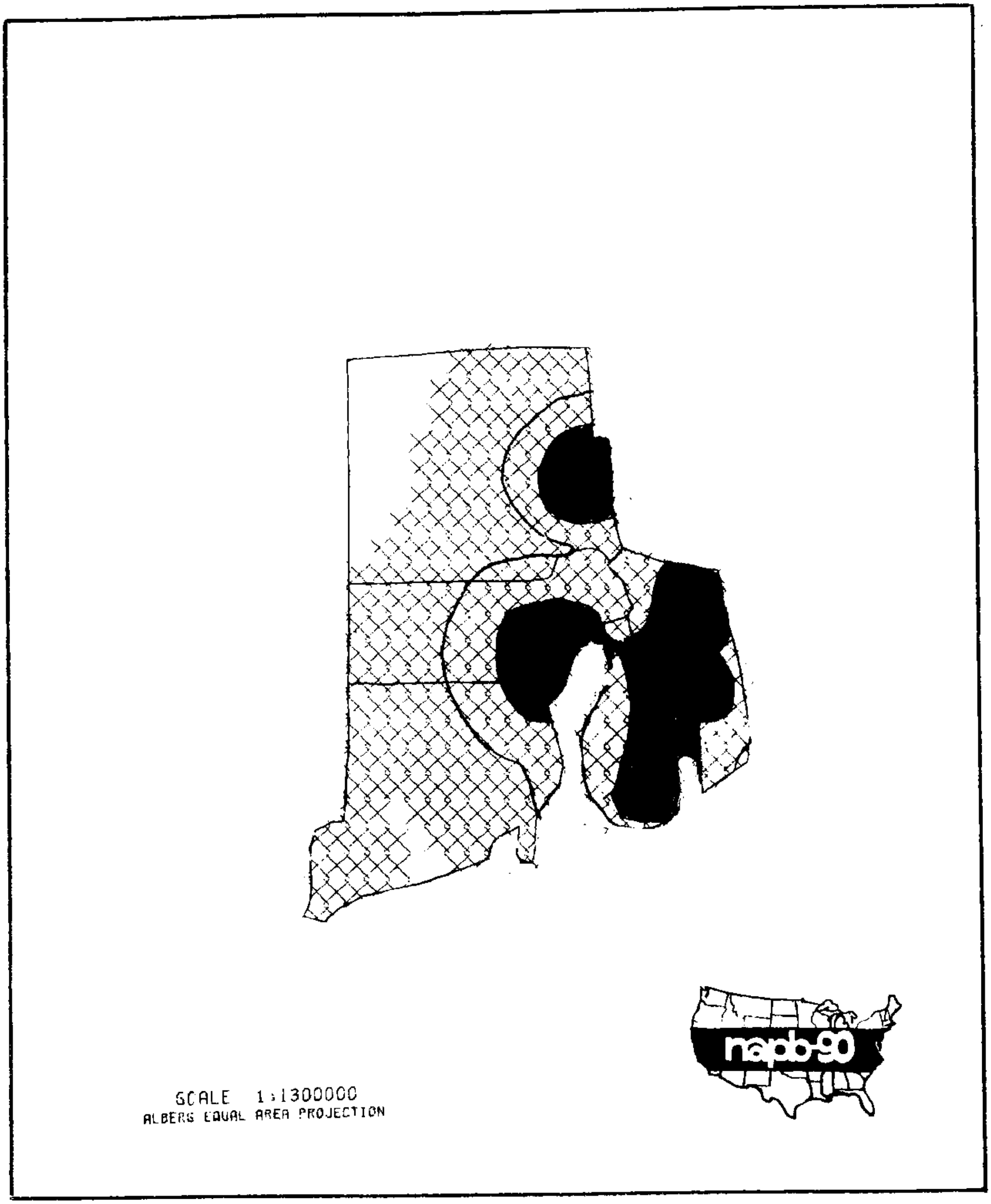
Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION I - STATE OF NEW HAMPSHIRE

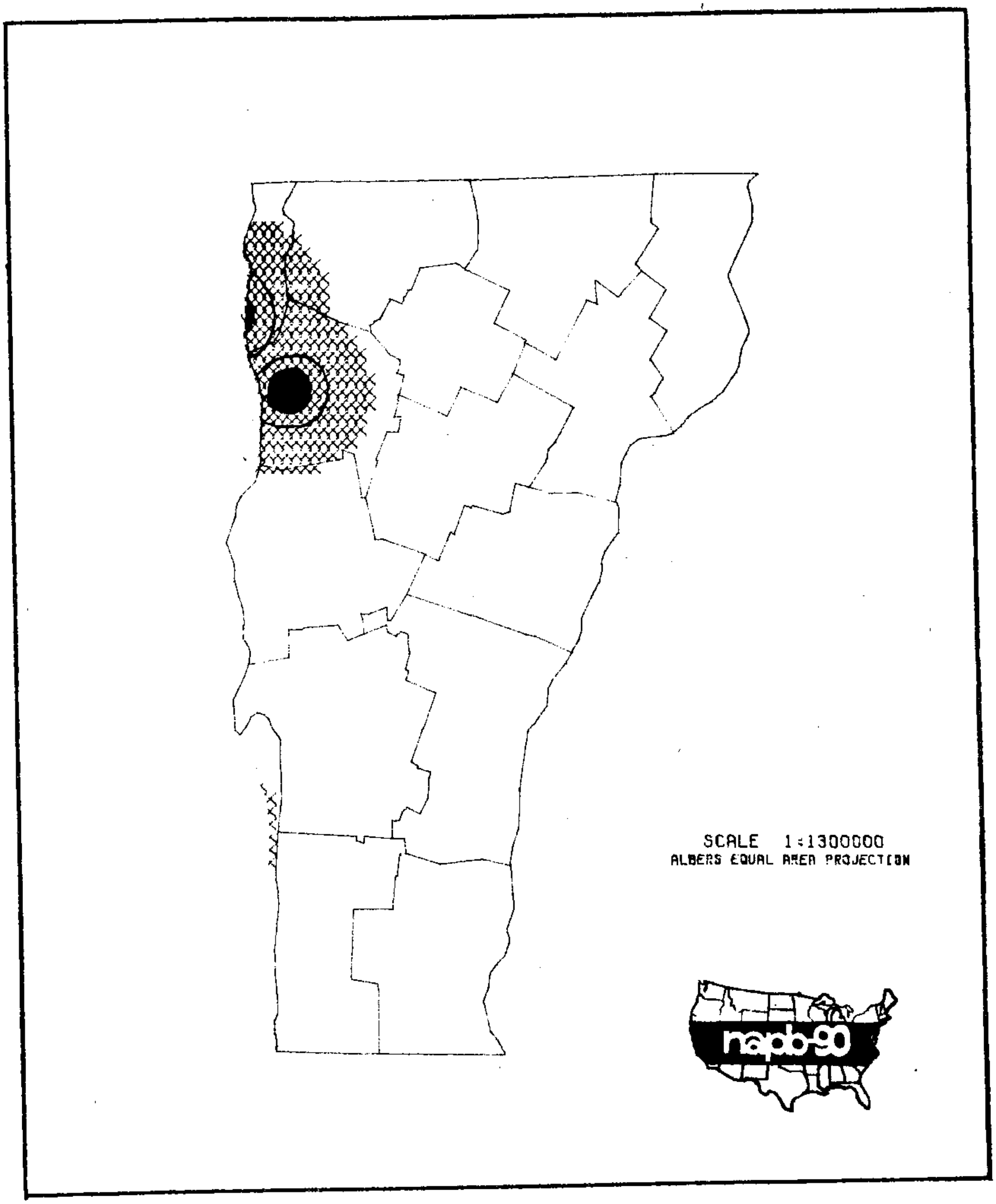
Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION I - RHODE ISLAND

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION I - STATE OF VERMONT

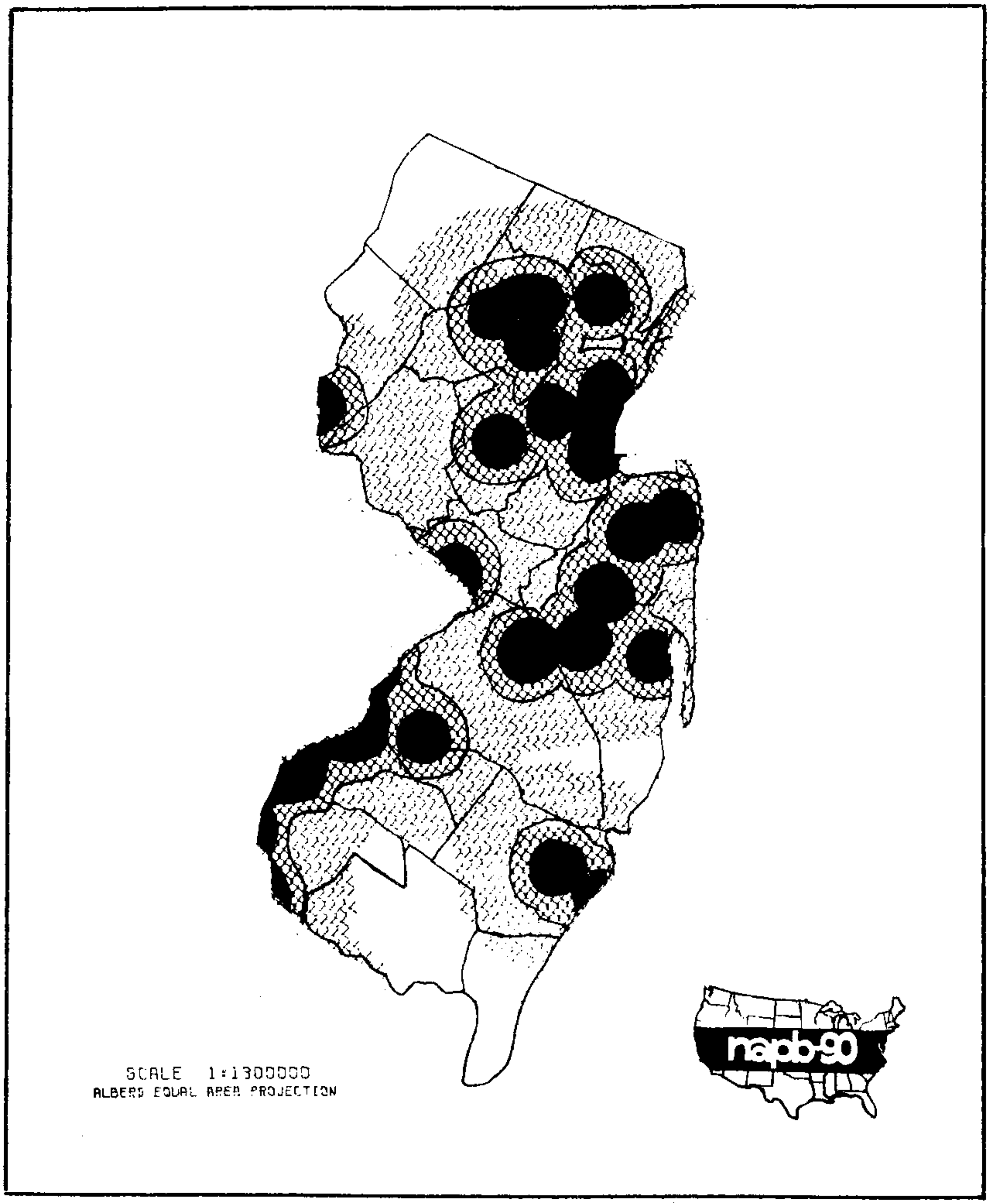
Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

FEMA REGION II -- DIRECT EFFECT & FIRE RISKS

STATE/DATA		TOTALS	VERY HIGH GT 10 psi	HIGH 5 to 10 psi	MEDIUM 2 to 5 psi	LOW .5 to 2 psi	NONE LT .5 psi
NEW JERSEY	Population	7551161 (1.00)	1158926 (.15)	1509143 (.20)	2795018 (.37)	1792627 (.24)	95447 (.04)
	Land Area	7468 (1.00)	614 (.08)	841 (.11)	2264 (.30)	4715 (.63)	-970 (N/A)*
NEW YORK	Population	17774143 (1.00)	4999963 (.28)	3657085 (.21)	3932084 (.22)	2595023 (.15)	589988 (.14)
	Land Area	43377 (1.00)	1317 (.03)	1577 (.04)	4232 (.10)	15282 (.35)	20969 (.48)
PUERTO RICO	Population	3196520 (1.00)	57893 (.02)	81156 (.03)	447313 (.14)	614558 (.19)	968600 (.63)
	Land Area	3459 (1.00)	***	***	***	***	***
VIRGIN ISLANDS	Population	104294 (1.00)	***	***	***	***	***
	Land Area	132 (1.00)	***	***	***	***	***
REGION II	Population	28324821 (1.00)	6216782 (.22)	5247384 (.18)	7174415 (.25)	5002208 (.17)	684032 (.17)
	Land Area	58436 (1.00)	1931 (.03)	2418 (.04)	6496 (.11)	19997 (.34)	27594 (.47)

*[NOTE: Anomaly caused by State resource grid points overlapping the State boundaries.]

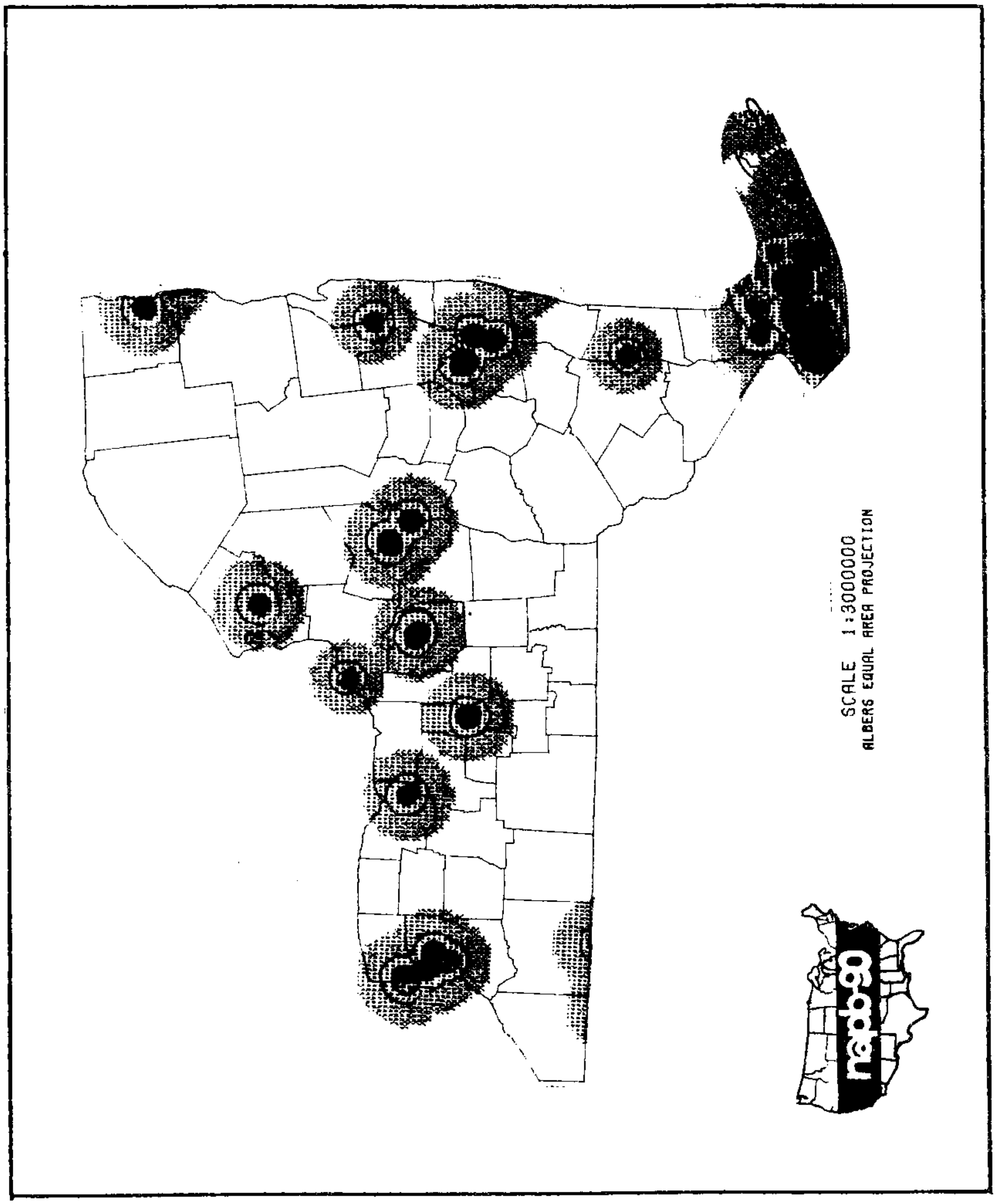
*** Data not available this printing



DIRECT EFFECTS RISK AREAS

FEMA REGION II - NEW JERSEY

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION II - NEW YORK

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

[MAP WILL BE FURNISHED SEPARATELY]

DIRECT EFFECTS RISK AREAS

FEMA REGION II - PUERTO RICO

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

[MAP WILL BE FURNISHED SEPARATELY]

DIRECT EFFECTS RISK AREAS

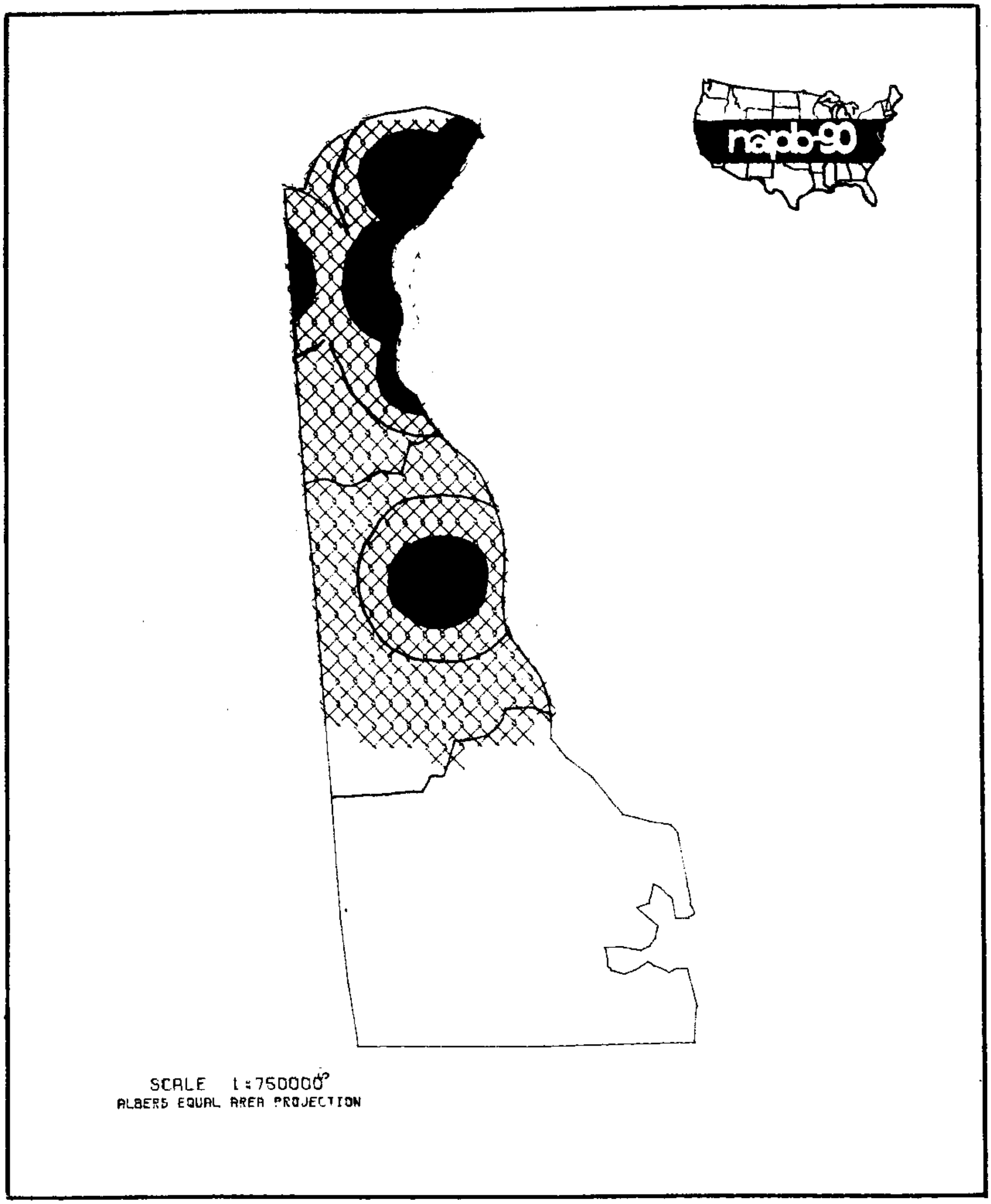
FEMA REGION II - TERRITORY OF THE VIRGIN ISLANDS

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

FEMA REGION III -- DIRECT EFFECTS & FIRE RISKS

STATE/DATA		TOTALS	VERY HIGH GT 10 psi	HIGH 5 to 10 psi	MEDIUM 2 to 5 psi	LOW .5 to 2 psi	NONE LT .5 psi
DIST OF COLUMBIA	Population	618906 (1.00)	379799 (.61)	182859 (.29)	56248 (.10)	--- (.00)	--- (.00)
	Land Area	93 (1.00)	63 (.68)*	38 (.41)*	15 (.16)*	--- (.00)	--- (.00)
DELAWARE	Population	530229 (1.00)	158757 (.30)	77026 (.15)	151013 (.28)	36073 (.08)	107360 (.19)
	Land Area	1933 (1.00)	111 (.06)	175 (.09)	412 (.21)	688 (.36)	547 (.28)
MARYLAND	Population	4381743 (1.00)	1084306 (.25)	843253 (.19)	1254439 (.29)	866103 (.20)	333642 (.08)
	Land Area	9838 (1.00)	762 (.08)	820 (.08)	2391 (.24)	4810 (.49)	1057 (.11)
PENNSYLVANIA	Population	11909083 (1.00)	2395327 (.20)	1870960 (.16)	2578836 (.22)	2908707 (.24)	2155253 (.18)
	Land Area	44892 (1.00)	1566 (.03)	1888 (.04)	6020 (.13)	17246 (.38)	18172 (.40)
VIRGINIA	Population	5715659 (1.00)	1358668 (.24)	765990 (.13)	976016 (.17)	1111036 (.19)	1503949 (.26)
	Land Area	39700 (1.00)	1106 (.03)	1068 (.03)	3349 (.08)	11812 (.30)	22365 (.56)
WEST VIRGINIA	Population	1952256 (1.00)	184914 (.09)	86709 (.05)	282609 (.14)	669705 (.34)	728319 (.38)
	Land Area	24124 (1.00)	439 (.02)	492 (.02)	1989 (.08)	6877 (.29)	14372 (.60)
REGION III	Population	25107876 (1.00)	5561771 (.22)	3826977 (.15)	5290161 (.21)	5591624 (.22)	4837343 (.19)
	Land Area	120550 (1.00)	4047 (.03)	4480 (.04)	14176 (.12)	41433 (.34)	56415 (.47)

*[NOTE: Anomaly caused by State resource grid points overlapping the State boundaries.]



DIRECT EFFECTS RISK AREAS

FEMA REGION III - DELAWARE

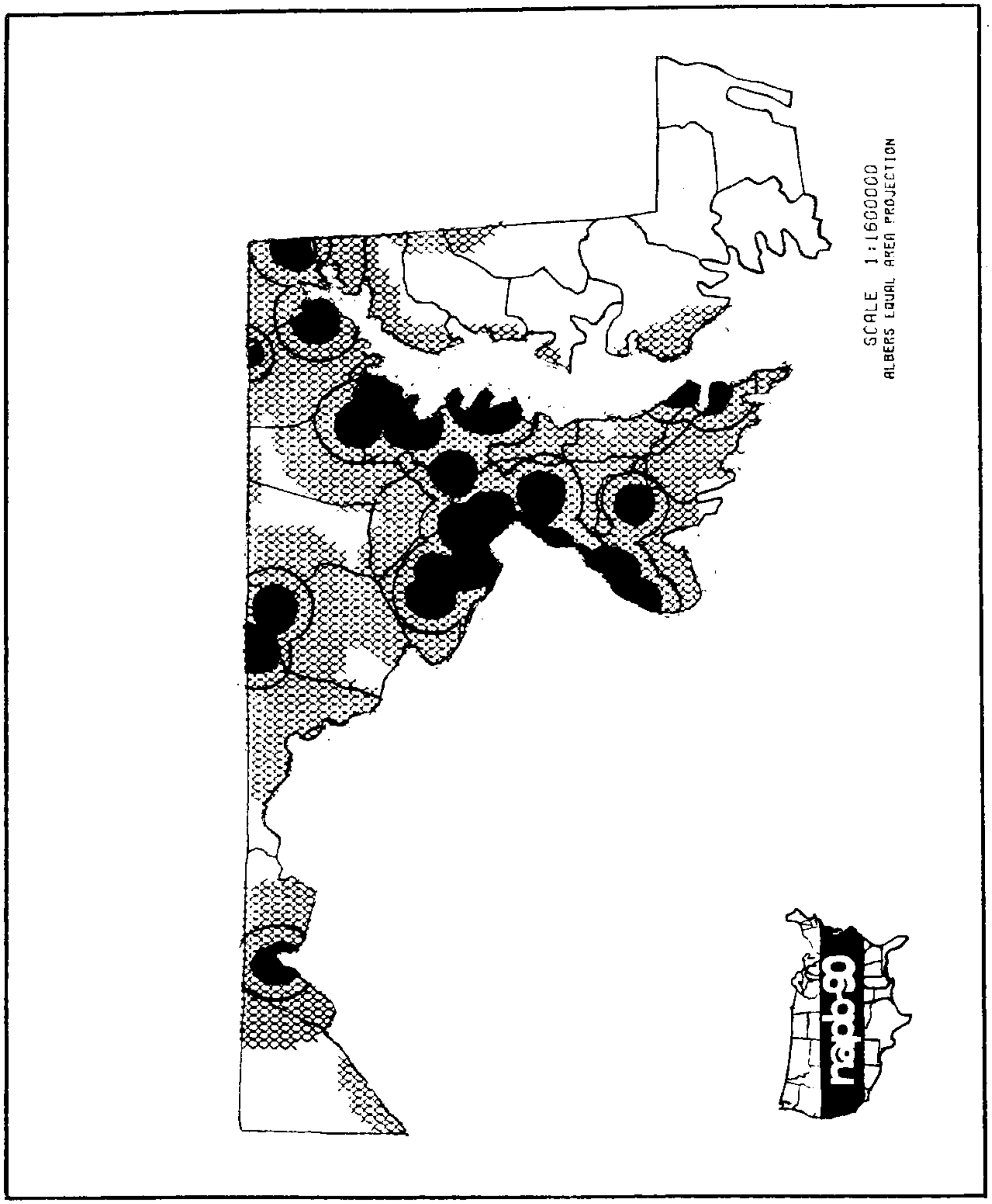
Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

[MAP WILL BE FURNISHED SEPARATELY]

DIRECT EFFECTS RISK AREAS

FEMA REGION III - DISTRICT OF COLUMBIA AREA

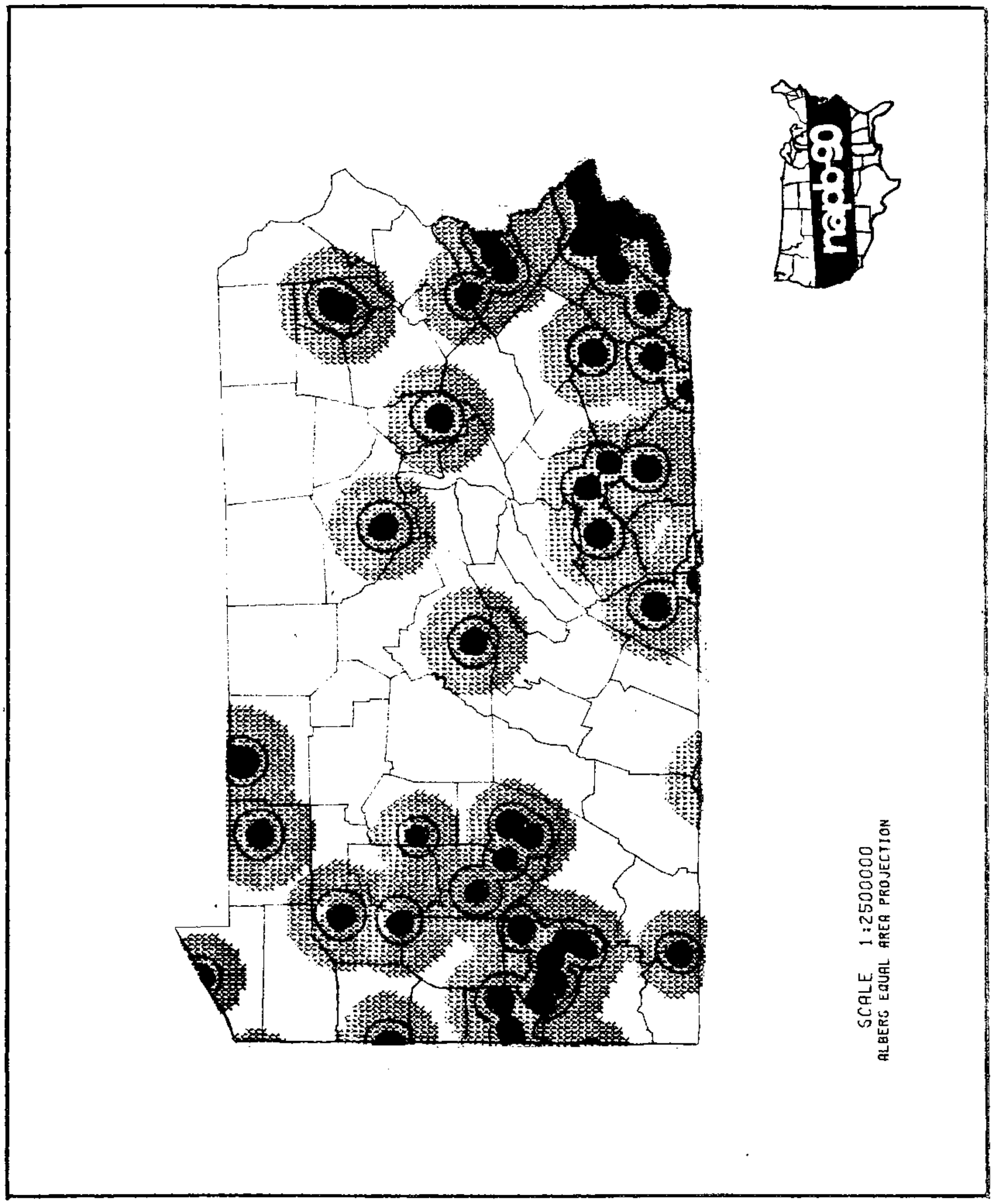
Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



D I R E C T   E F F E C T S   R I S K   A R E A S

FEMA REGION III - MARYLAND

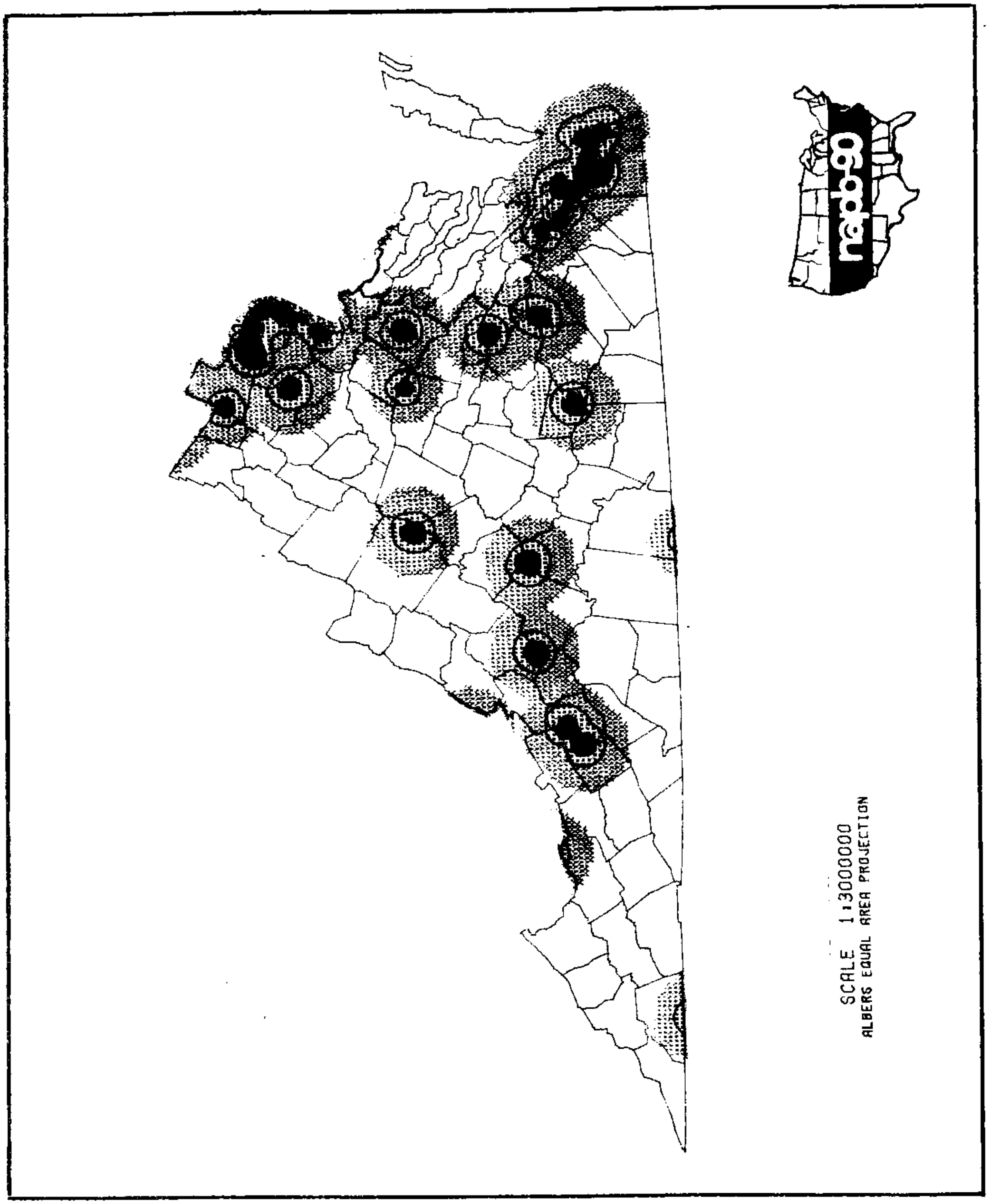
Black Area:	Equal to or greater than 5.0 psi
Ringed Area:	Equal to or greater than 2.0 psi
Unringed Area:	Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION III - PENNSYLVANIA

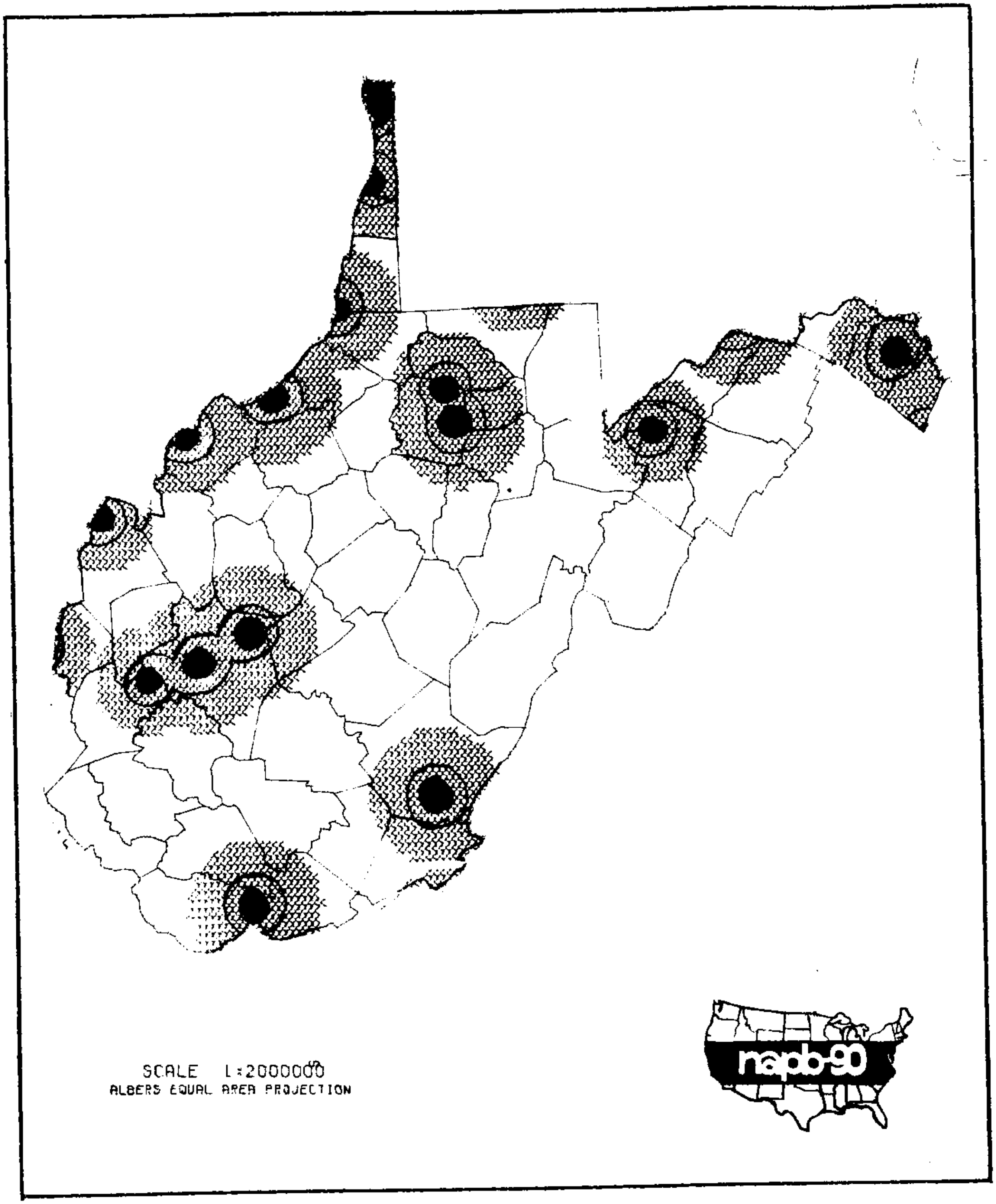
Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION III - VIRGINIA

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



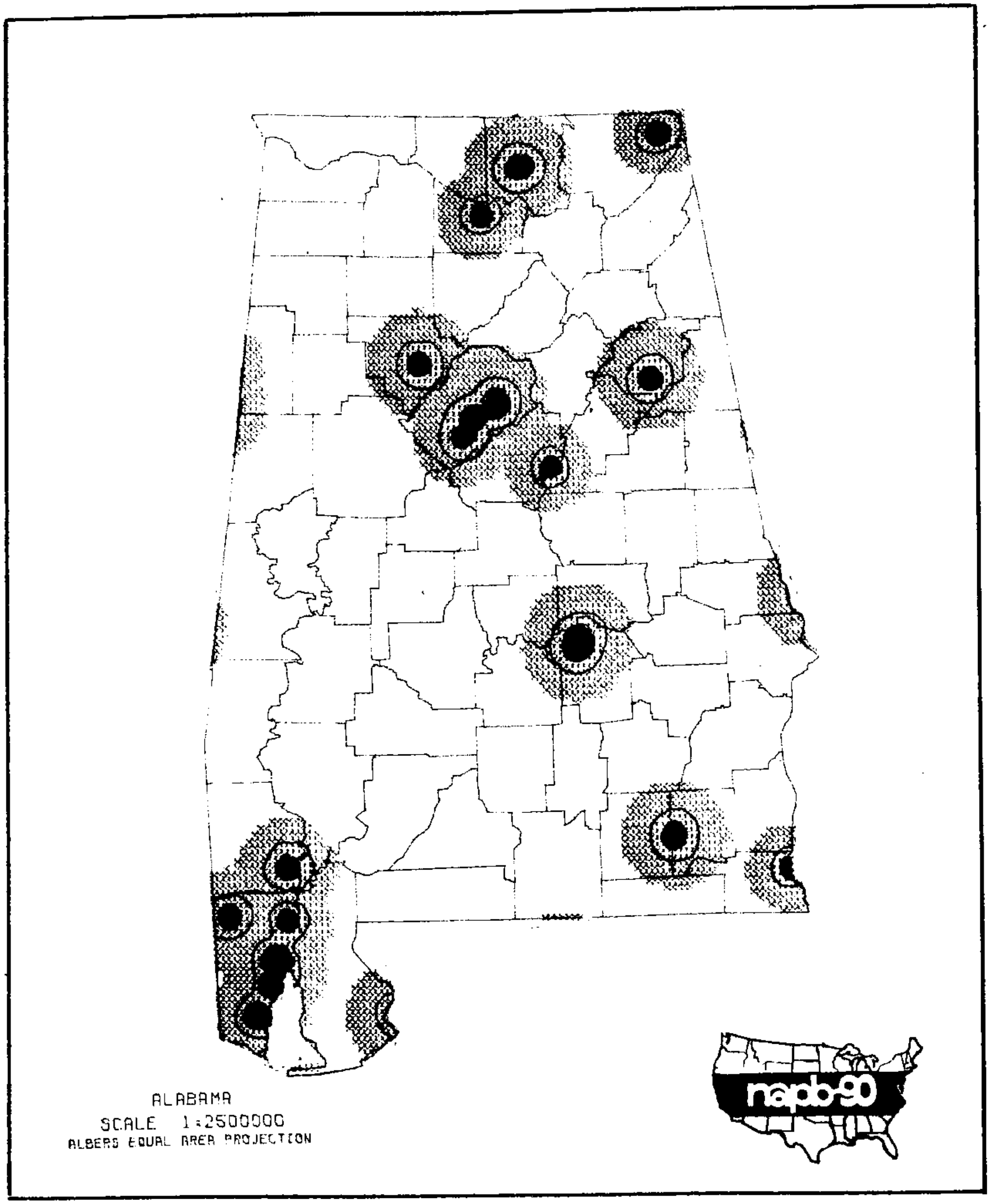
DIRECT EFFECTS RISK AREAS

FEMA REGION III - WEST VIRGINIA

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

FEMA REGION IV -- DIRECT EFFECTS & FIRE RISKS

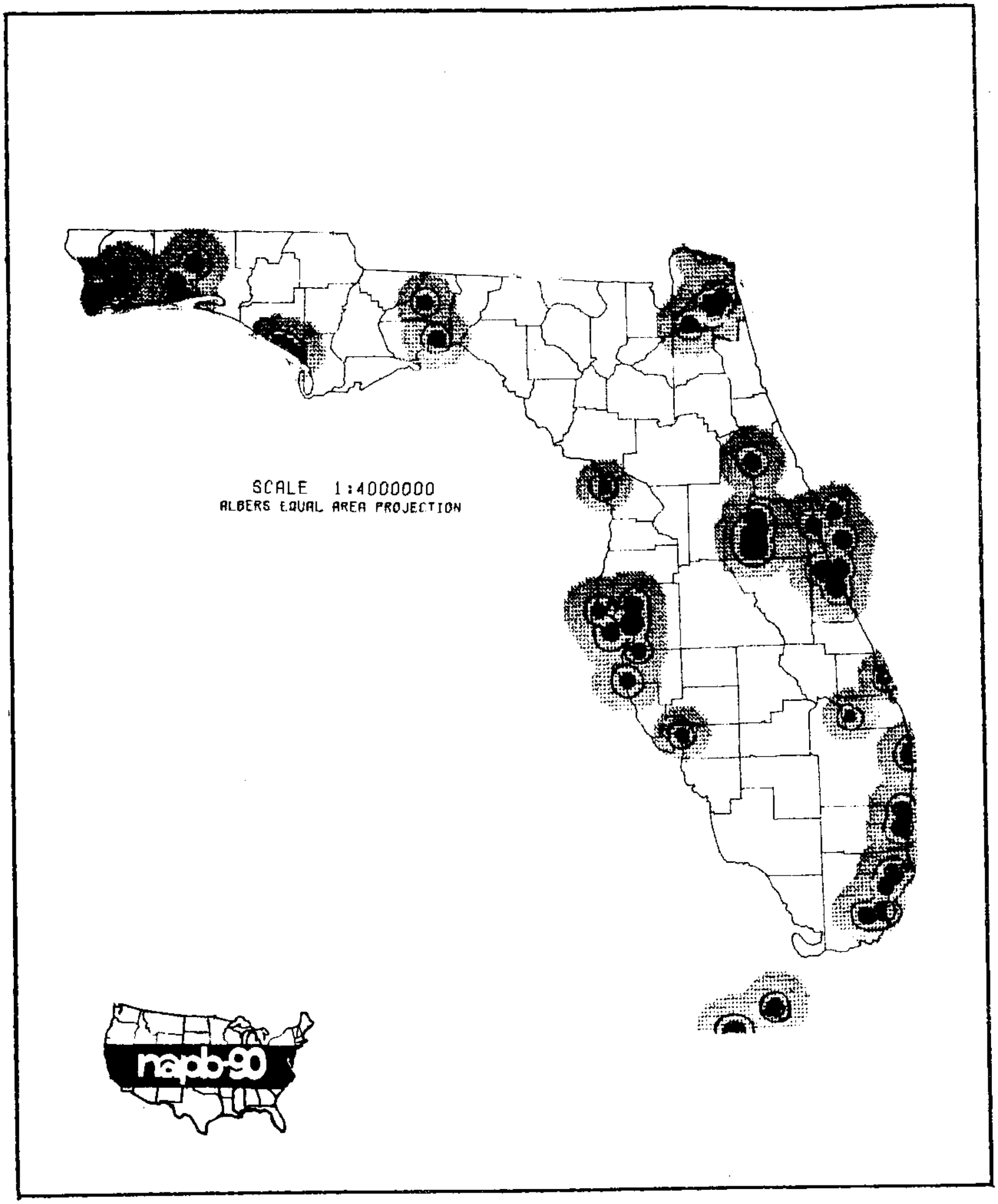
STATE/DATE		TOTALS	VERY HIGH GT 10 psi	HIGH 5 to 10 psi	MEDIUM 2 to 5 psi	LOW .5 to 2 psi	NONE LT .5 psi
ALABAMA	Population	3959145 (1.00)	496537 (.13)	428603 (.11)	557090 (.14)	686281 (.17)	1790634 (.45)
	Land Area	50739 (1.00)	523 (.01)	747 (.01)	2629 (.05)	14866 (.29)	31954 (.63)
FLORIDA	Population	11883346 (1.00)	2457768 (.21)	1587622 (.13)	2485369 (.21)	2094563 (.18)	3258024 (.27)
	Land Area	63397 (1.00)	1333 (.02)	1397 (.02)	5025 (.08)	17732 (.28)	37920 (.60)
GEORGIA	Population	5929253 (1.00)	820023 (.14)	632291 (.11)	1312362 (.22)	1192531 (.20)	1972026 (.33)
	Land Area	58117 (1.00)	746 (.01)	952 (.02)	3629 (.06)	12188 (.21)	40602 (.70)
KENTUCKY	Population	3730146 (1.00)	403894 (.11)	289245 (.08)	448707 (.12)	905660 (.24)	1682640 (.45)
	Land Area	39639 (1.00)	397 (.01)	566 (.01)	1862 (.05)	7940 (.20)	28874 (.73)
MISSISSIPPI	Population	2617133 (1.00)	228224 (.09)	187546 (.07)	315988 (.12)	380394 (.15)	1504981 (.57)
	Land Area	47174 (1.00)	413 (.01)	493 (.01)	1797 (.04)	7297 (.15)	37192 (.79)
N. CAROLINA	Population	6233774 (1.00)	391174 (.06)	256164 (.04)	732968 (.12)	1251116 (.20)	3602352 (.58)
	Land Area	48843 (1.00)	540 (.01)	597 (.01)	2439 (.05)	9469 (.19)	35789 (.73)
S. CAROLINA	Population	3343422 (1.00)	341270 (.10)	245008 (.07)	356102 (.11)	649206 (.19)	1751836 (.52)
	Land Area	30207 (1.00)	333 (.01)	519 (.02)	1724 (.06)	7078 (.23)	20553 (.68)
TENNESSEE	Population	4746516 (1.00)	628268 (.13)	359393 (.08)	648405 (.14)	1030830 (.22)	2079620 (.44)
	Land Area	40930 (1.00)	503 (.01)	798 (.02)	2243 (.05)	7390 (.18)	29996 (.73)
REGION IV	Population	42442705 (1.00)	5767158 (.16)	3985872 (.09)	6856991 (.16)	8190581 (.19)	17642103 (.42)
	Land Area	379046 (1.00)	4788 (.01)	6069 (.02)	21348 (.06)	83971 (.22)	262888 (.69)



D I R E C T   E F F E C T S   R I S K   A R E A S

FEMA REGION IV - ALABAMA

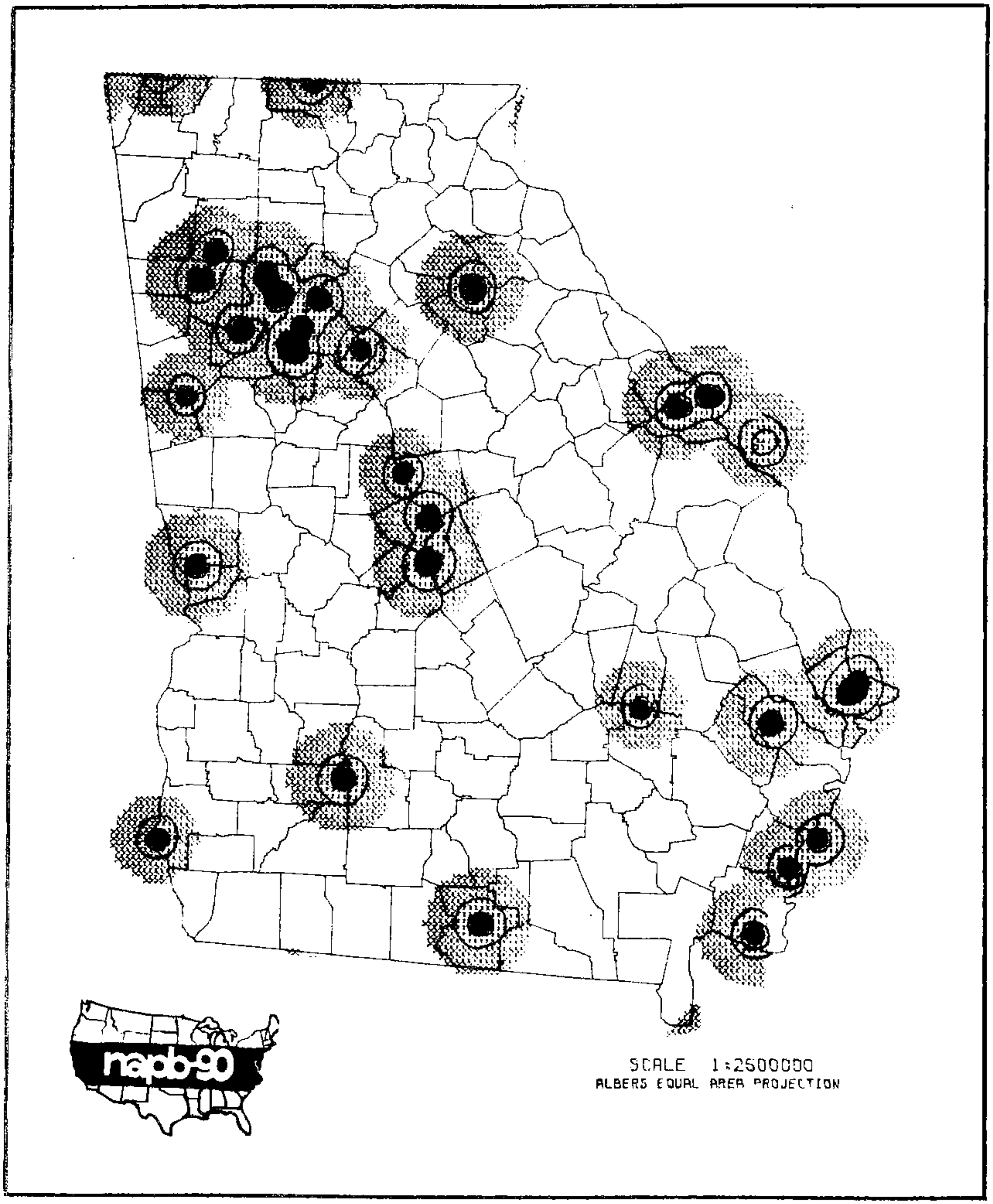
Black Area:	Equal to or greater than 5.0 psi
Ringed Area:	Equal to or greater than 2.0 psi
Unringed Area:	Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION IV - FLORIDA.

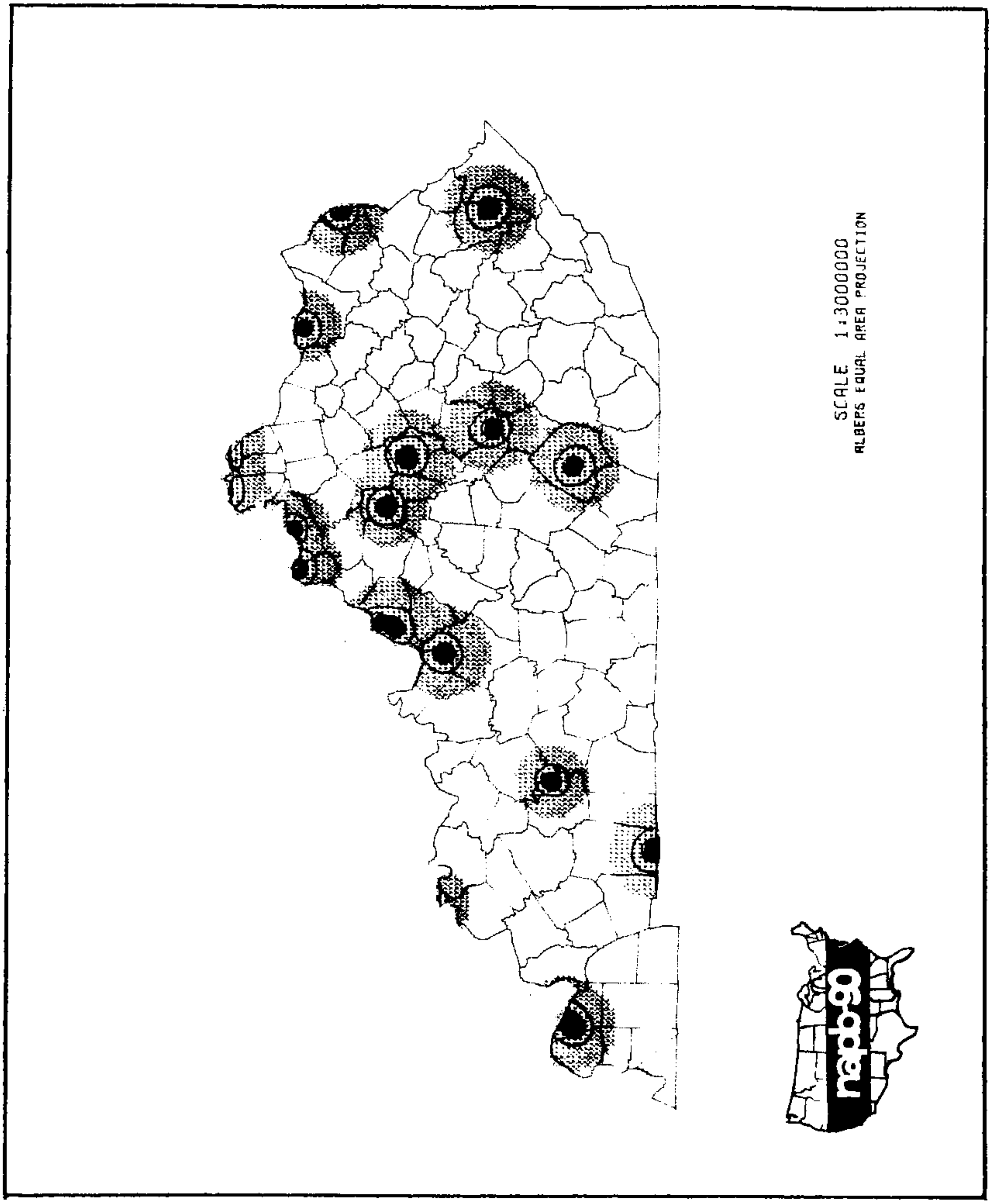
Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION IV - GEORGIA

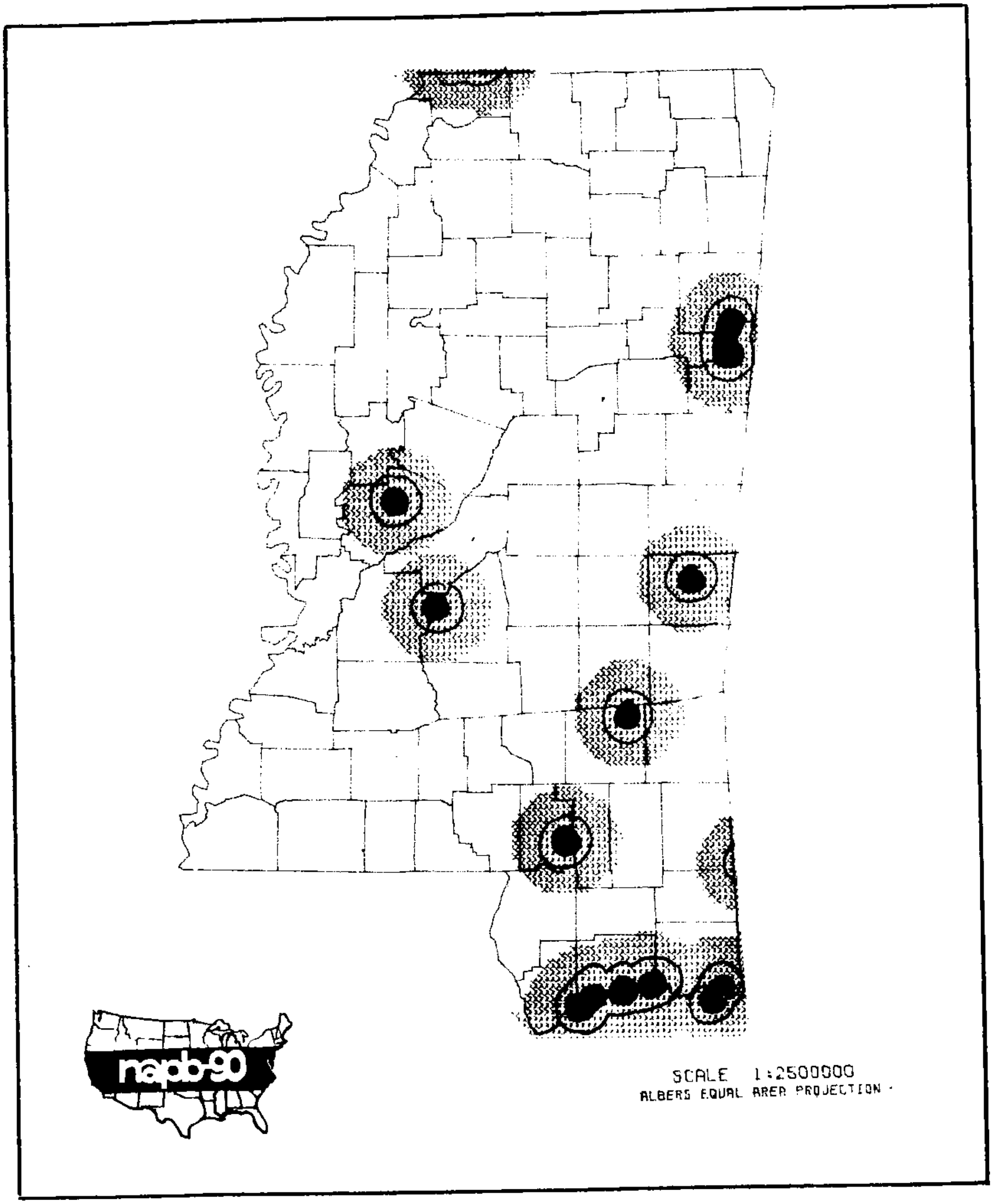
Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION IV - KENTUCKY

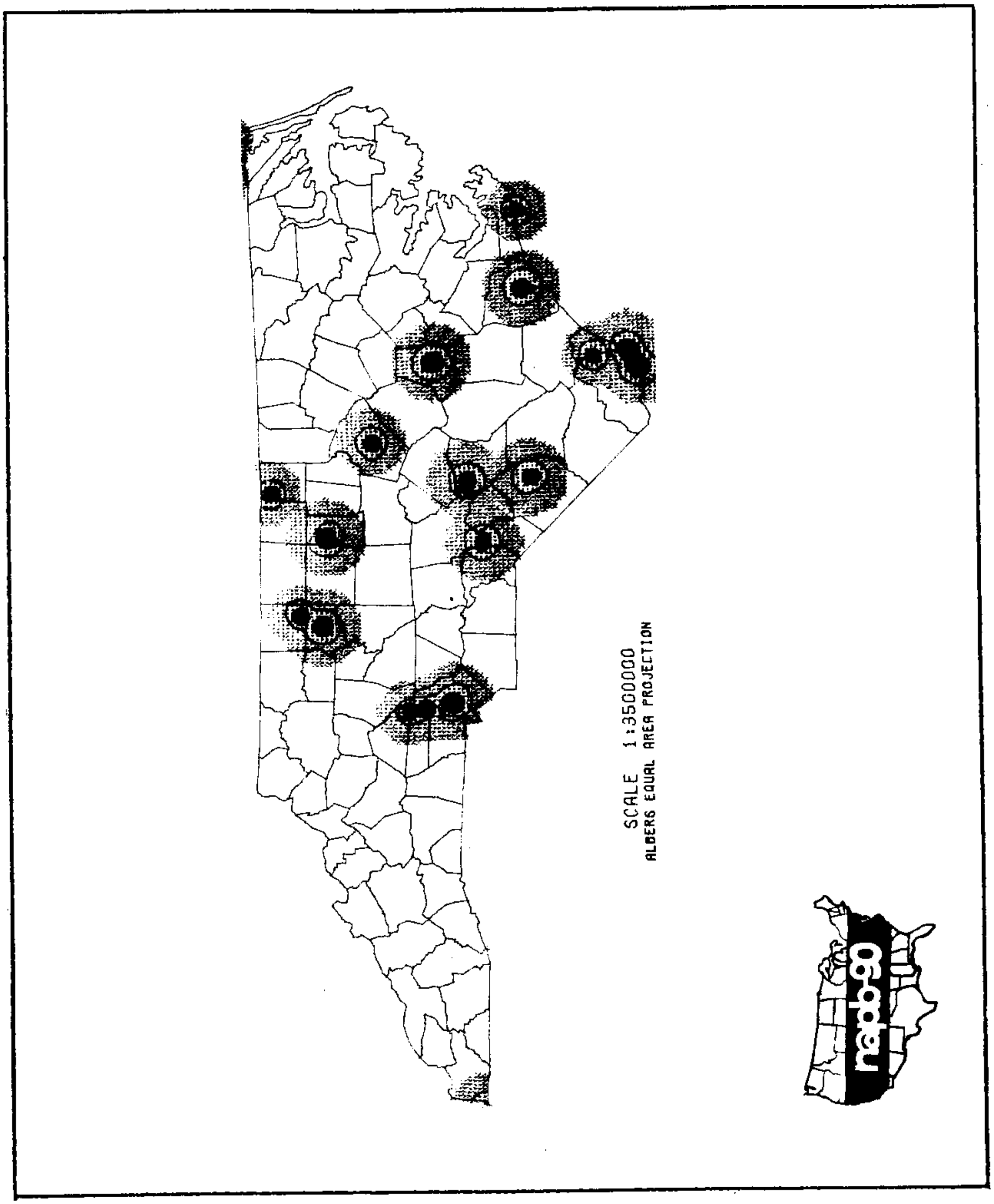
Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION IV - MISSISSIPPI

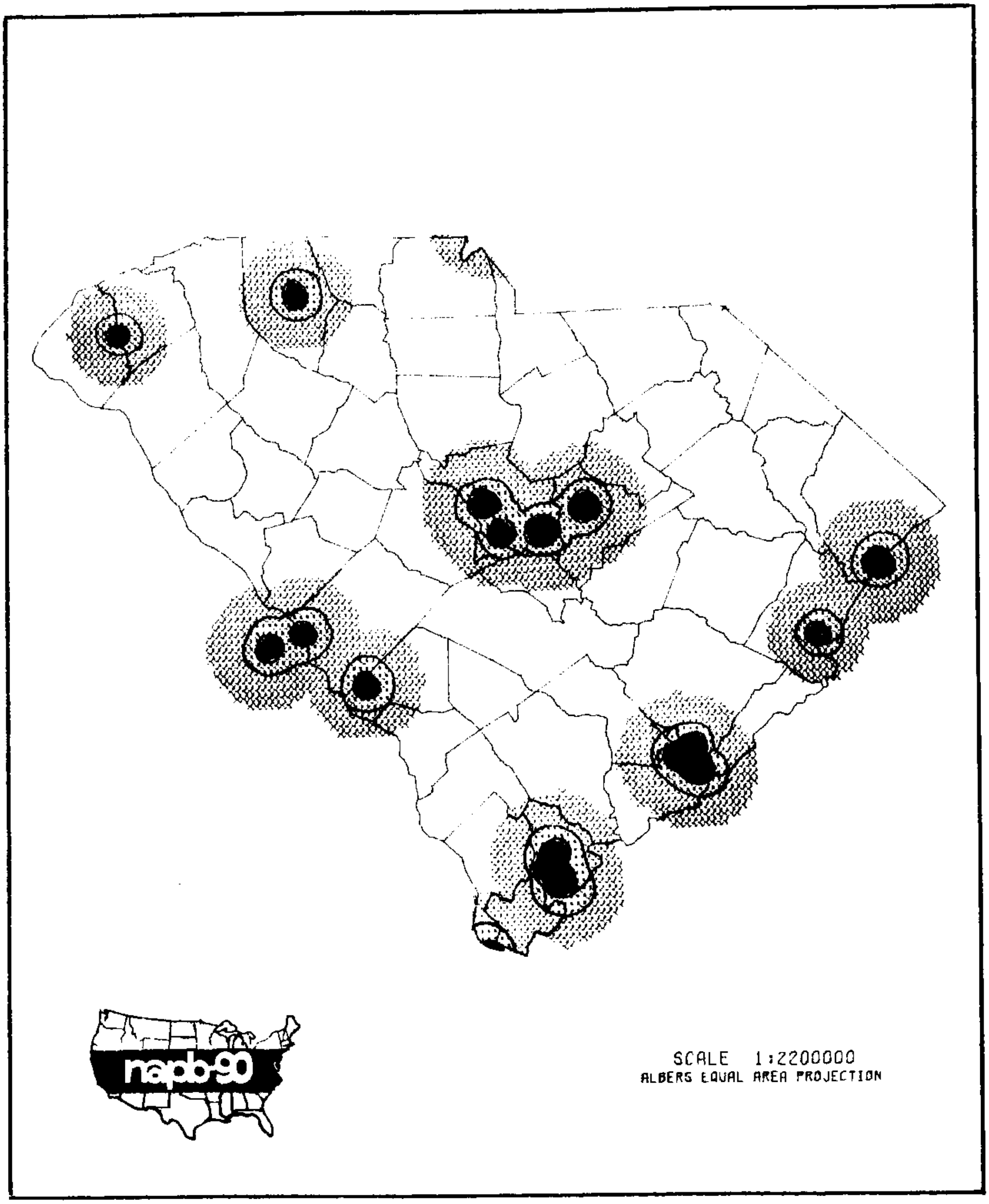
Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION IV - NORTH CAROLINA

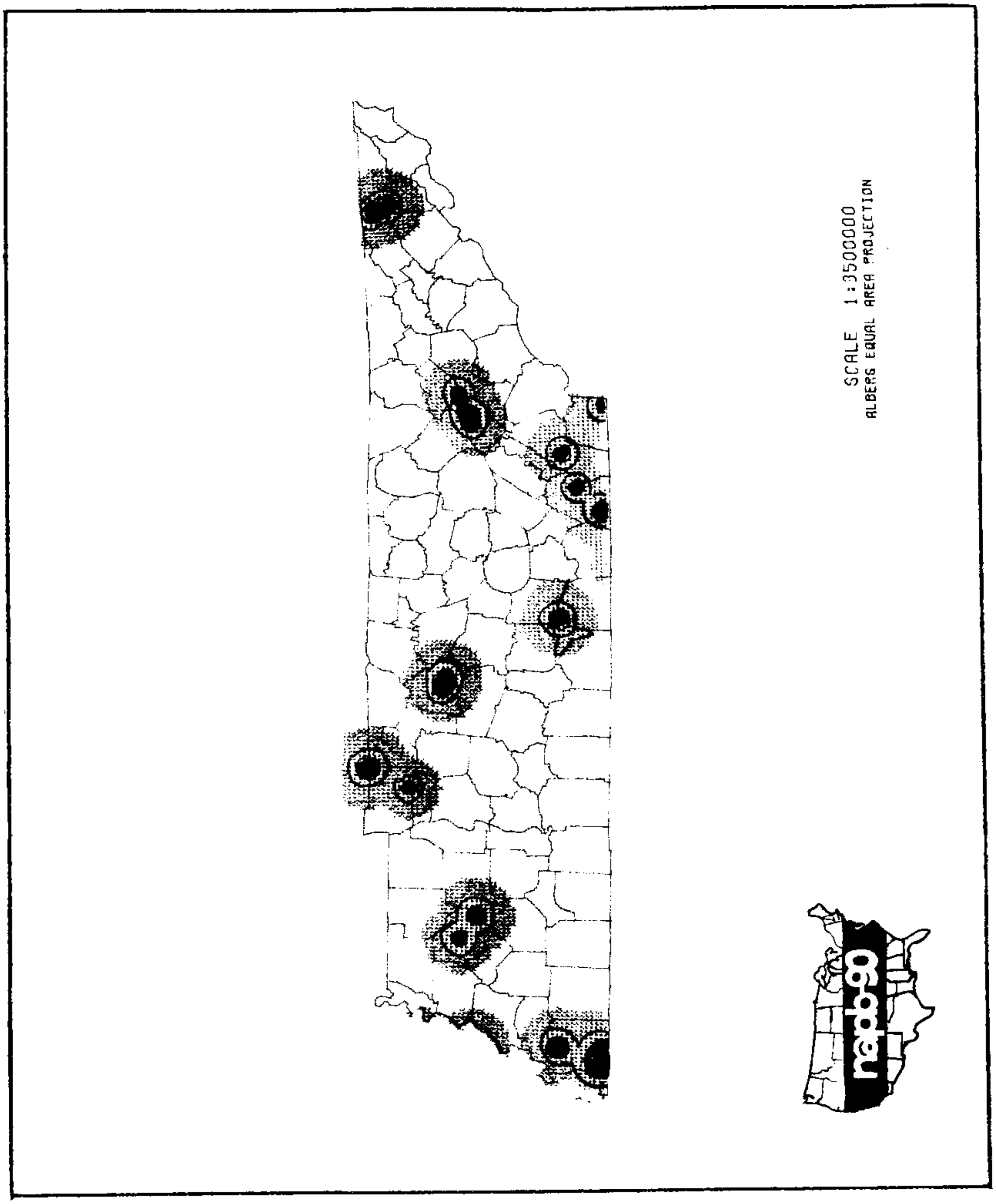
Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION IV - SOUTH CAROLINA

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

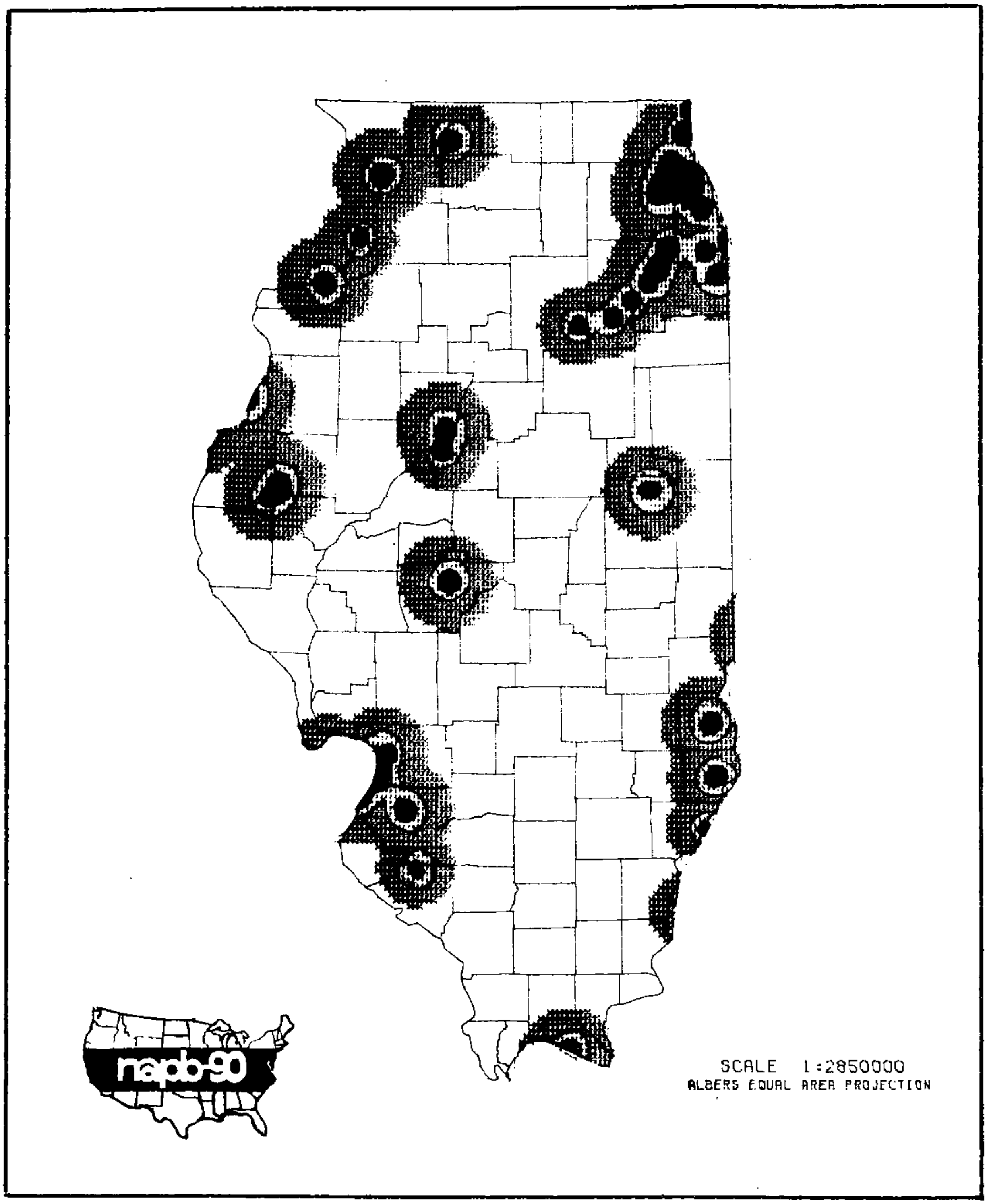
FEMA REGION IV - TENNESSEE

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

FEMA REGION V -- DIRECT EFFECTS & FIRE RISKS

STATE/DATA		TOTALS	VERY HIGH GT 10 psi	HIGH 5 to 10 psi	MEDIUM 2 to 5 psi	LOW .5 to 2 psi	NONE LT .5 psi
ILLINOIS	Population	11557256 (1.00)	2085709 (.18)	1624701 (.14)	3225483 (.28)	1914989 (.17)	2706374 (.23)
	Land Area	51586 (1.00)	1275 (.02)	1338 (.03)	4158 (.08)	12929 (.25)	32186 (.62)
INDIANA	Population	5499636 (1.00)	783413 (.14)	607437 (.11)	789434 (.14)	1088128 (.20)	2231224 (.41)
	Land Area	35963 (1.00)	555 (.02)	683 (.02)	2439 (.07)	10421 (.29)	21865 (.61)
MICHIGAN	Population	9030778 (1.00)	1570330 (.17)	1220636 (.14)	1918858 (.21)	1952054 (.22)	2368900 (.26)
	Land Area	57019 (1.00)	1042 (.02)	1238 (.02)	4227 (.07)	17869 (.31)	32643 (.57)
MINNESOTA	Population	4181231 (1.00)	645927 (.16)	446913 (.11)	589812 (.14)	515383 (.12)	1983196 (.47)
	Land Area	79547 (1.00)	413 (.01)	418 (.01)	1333 (.02)	4745 (.06)	72638 (.91)
OHIO	Population	10638633 (1.00)	1605297 (.15)	1490643 (.14)	2611992 (.25)	3082059 (.29)	1848642 (.17)
	Land Area	41006 (1.00)	878 (.02)	1571 (.04)	4819 (.12)	18690 (.46)	15048 (.37)
WISCONSIN	Population	4779553 (1.00)	427685 (.09)	126942 (.03)	557331 (.12)	755110 (.16)	2912485 (.31)
	Land Area	54424 (1.00)	302 (.01)	264 (xxx)	1243 (.02)	4613 (.08)	48002 (.88)
REGION V	Population	45687087 (1.00)	7118361 (.16)	5517272 (.12)	9692910 (.21)	9307723 (.20)	14050821 (.31)
	Land Area	323545 (1.00)	4465 (.01)	5512 (.02)	18219 (.06)	69267 (.21)	226082 (.70)

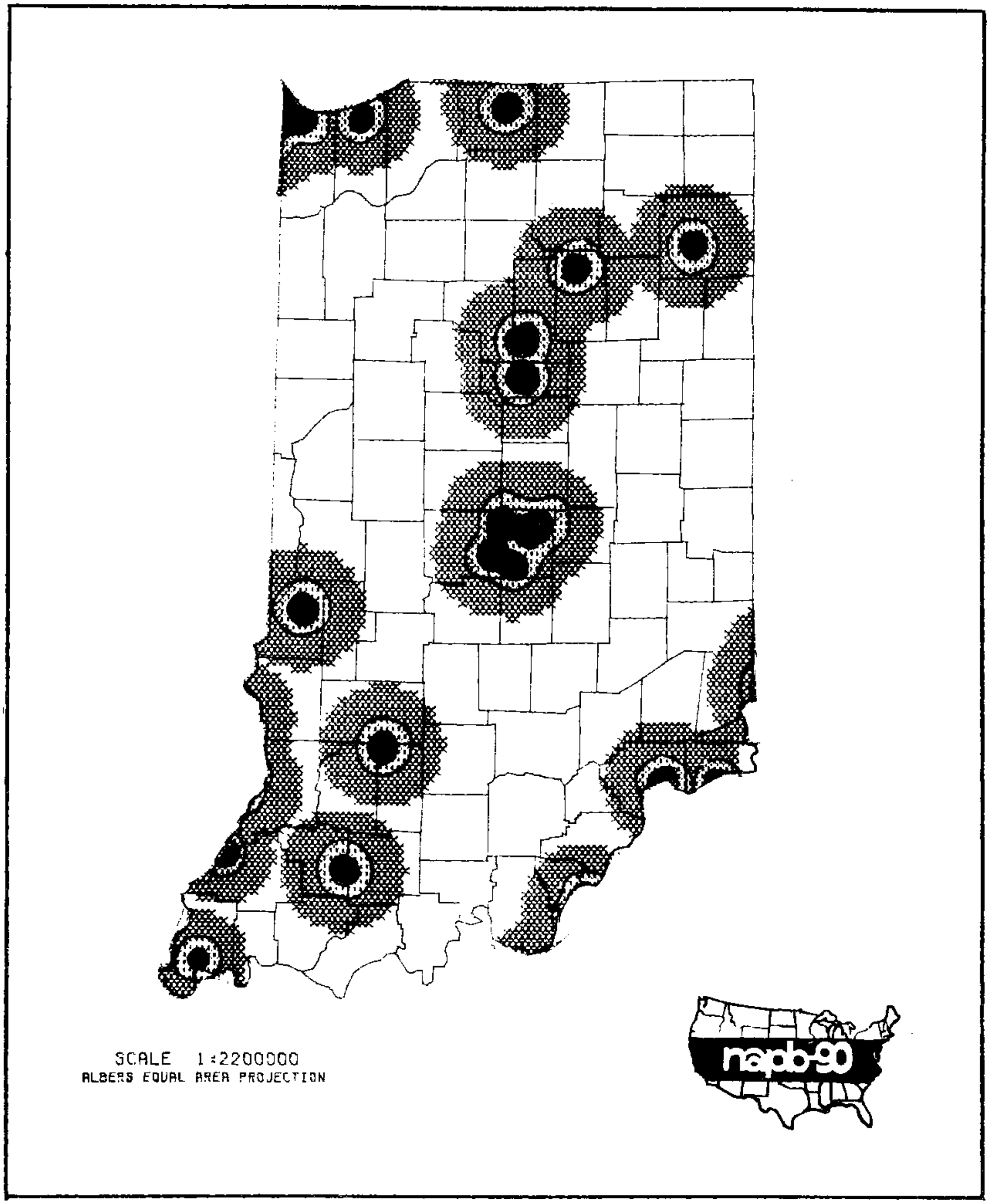
(xxx) Less than 1 percent



DIRECT EFFECTS RISK AREAS

FEMA REGION V - ILLINOIS

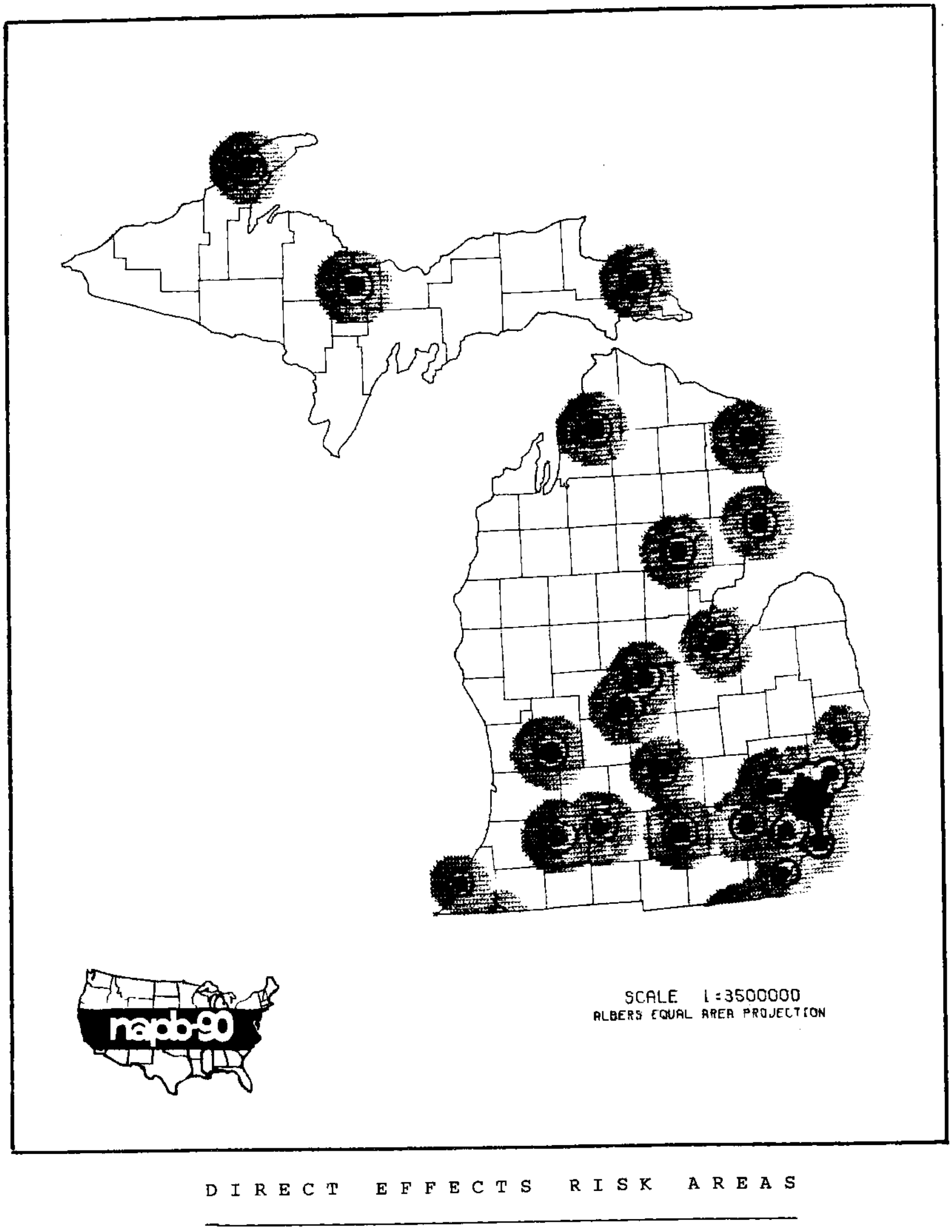
Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION V - INDIANA

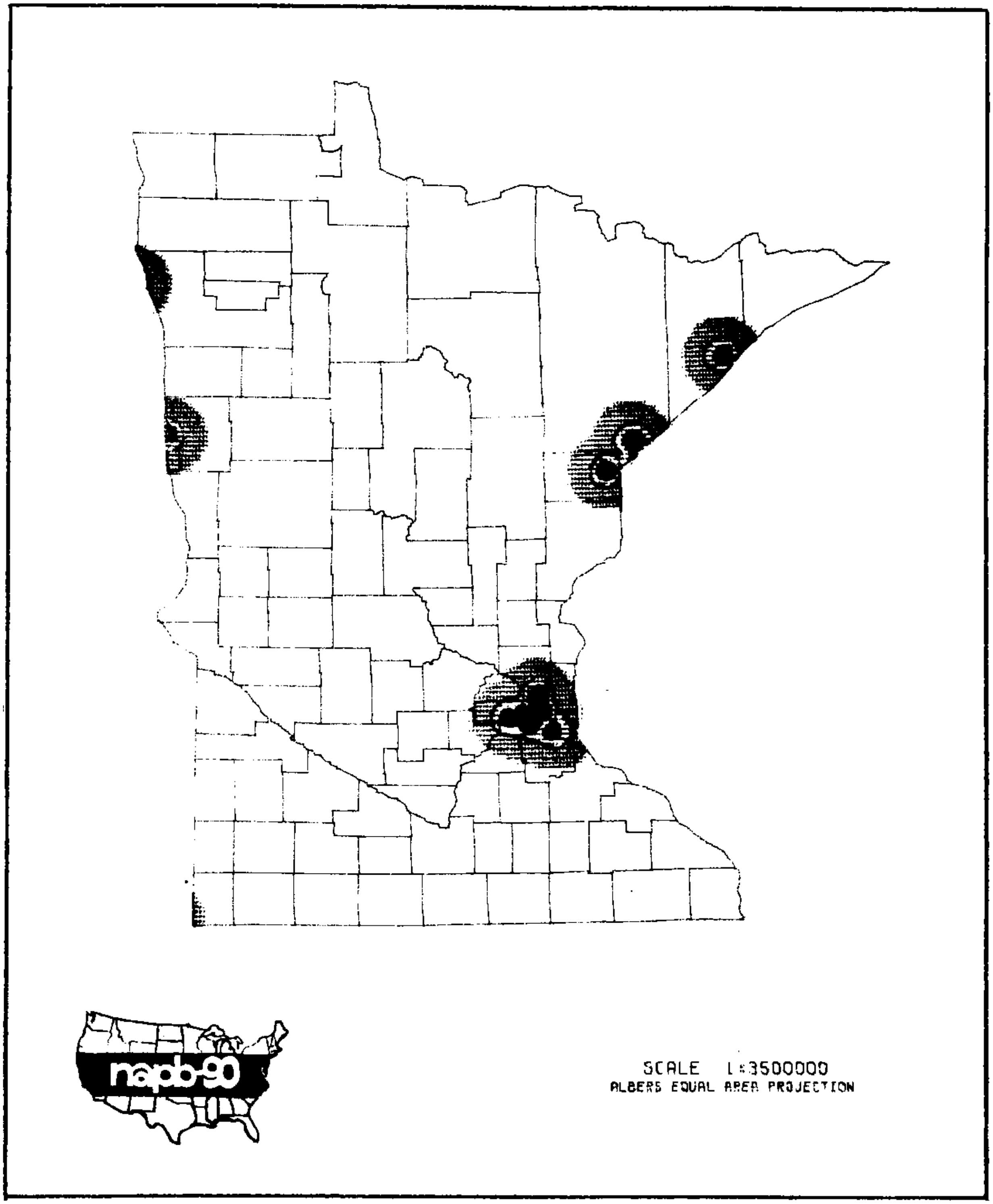
Black Area:	Equal to or greater than 5.0 psi
Ringed Area:	Equal to or greater than 2.0 psi
Unringed Area:	Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION V - MICHIGAN

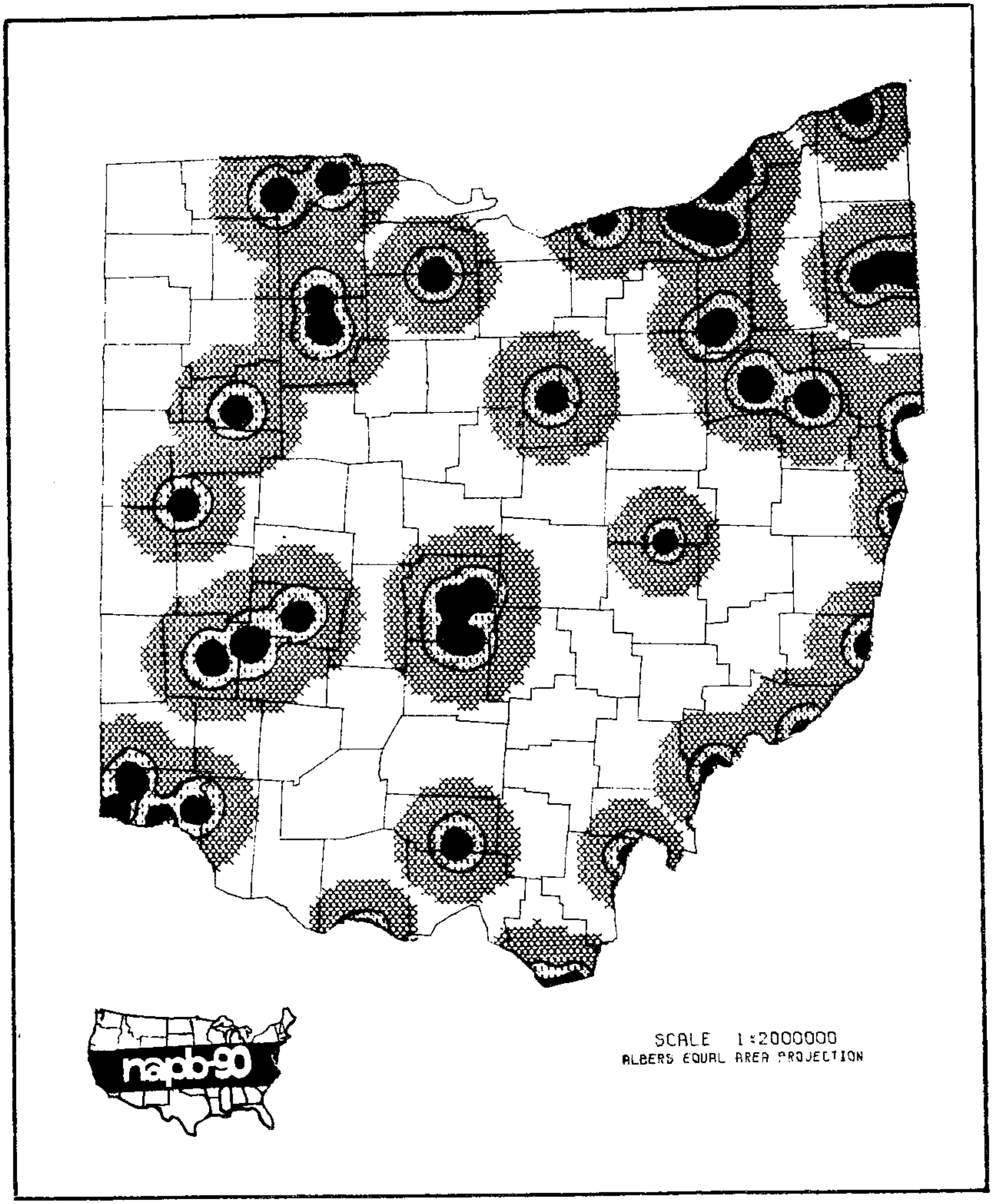
Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION V - MINNESOTA

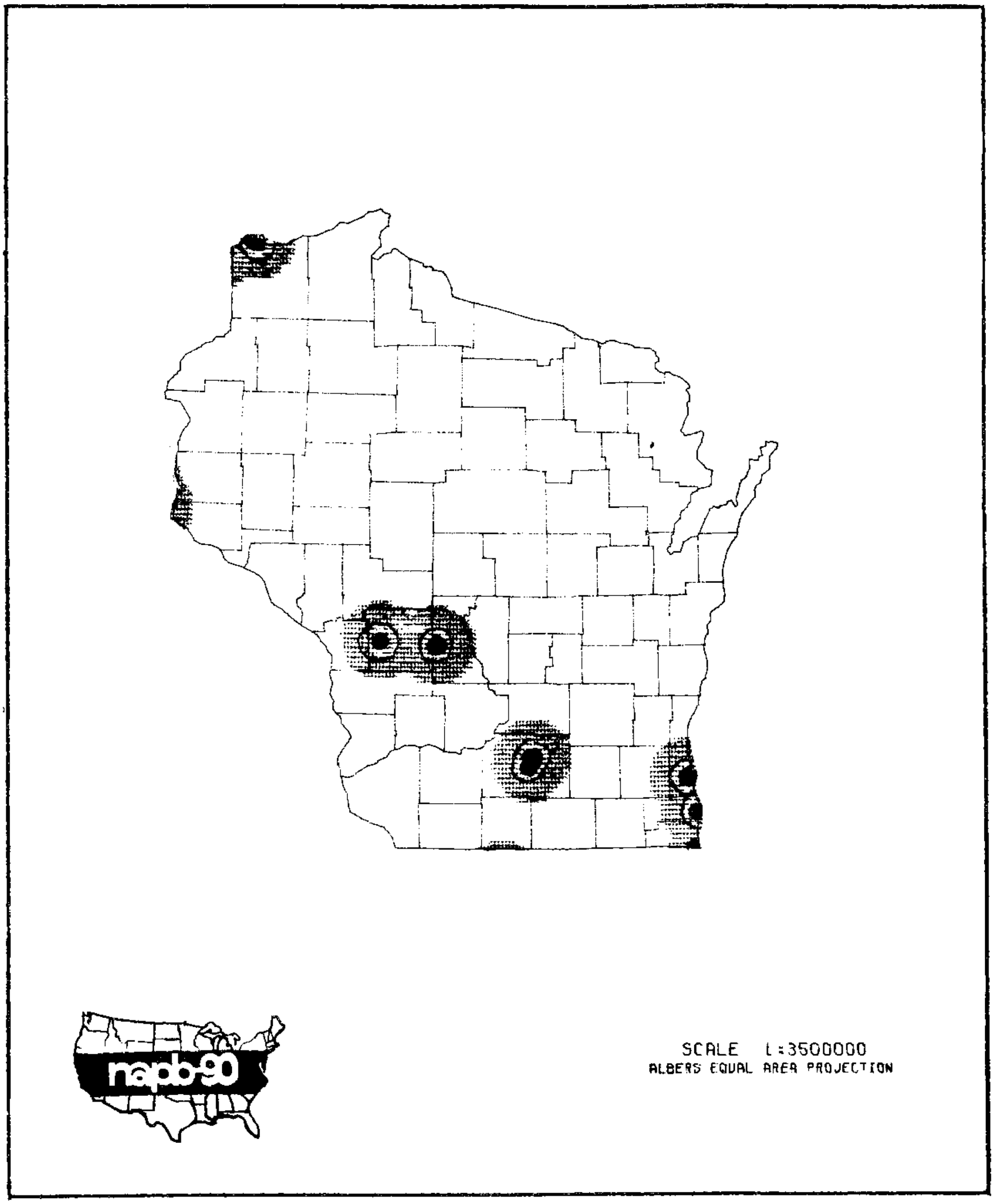
Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION V - OHIO

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

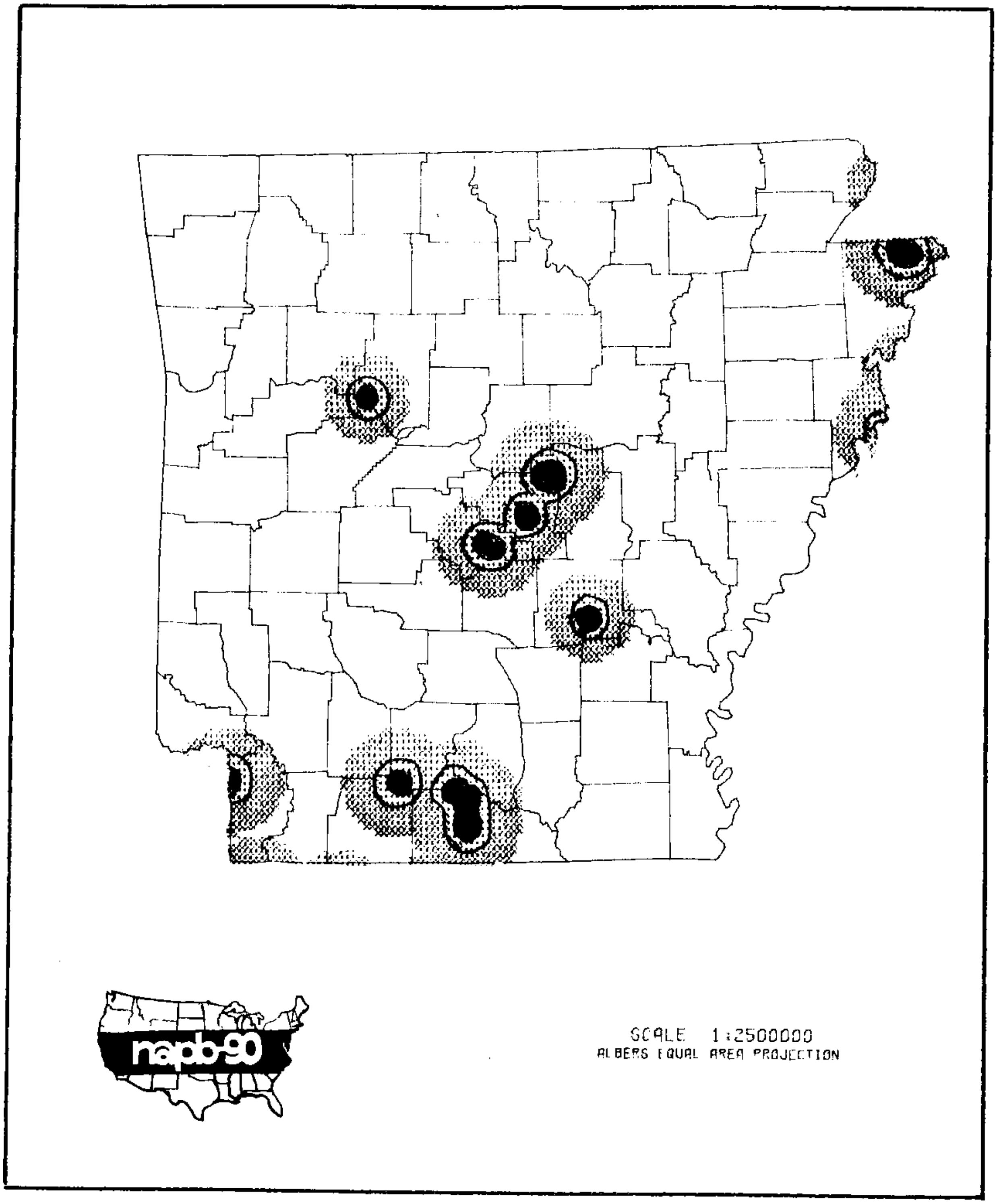
FEMA REGION V - WISCONSIN

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

FEMA REGION VI -- DIRECT EFFECTS & FIRE RISKS

STATE/DATA		TOTALS	VERY HIGH GT 10 psi	HIGH 5 to 10 psi	MEDIUM 2 to 5 psi	LOW .5 to 2 psi	NONE LT .5 psi
ARKANSAS	Population	2363641 (1.00)	131262 (.06)	117493 (.13)	294869 (.21)	288032 (.16)	1531985 (.65)
	Land Area	52082 (1.00)	265 (xxx)	333 (.01)	1291 (.02)	6009 (.12)	44184 (.85)
LOUISIANA	Population	4525019 (1.00)	784371 (.17)	806928 (.05)	705803 (.12)	785040 (.19)	1442877 (.32)
	Land Area	44520 (1.00)	1095 (.02)	1095 (.02)	3438 (.08)	11998 (.27)	27158 (.61)
NEW MEXICO	Population	1460783 (1.00)	242269 (.16)	131289 (.18)	363755 (.16)	286246 (.12)	437224 (.30)
	Land Area	121336 (1.00)	545 (xxx)	555 (xxx)	2826 (.02)	10331 (.09)	107709 (.89)
OKLAHOMA	Population	3364919 (1.00)	365265 (.11)	427257 (.09)	634233 (.25)	744644 (.17)	1193520 (.35)
	Land Area	68656 (1.00)	661 (.01)	762 (.01)	2962 (.04)	14553 (.21)	49718 (.72)
TEXAS	Population	16426000 (1.00)	3169088 (.19)	2191289 (.13)	3872412 (.19)	3146160 (.20)	4047051 (.25)
	Land Area	261989 (1.00)	2401 (.01)	2603 (.01)	9120 (.03)	37125 (.14)	210470 (.80)
REGION VI	Population	28140362 (1.00)	4692255 (.17)	3674256 (.13)	5871072 (.21)	5250122 (.19)	8652657 (.31)
	Land Area	548583 (1.00)	4703 (.01)	5348 (.01)	19637 (.04)	80016 (.15)	439536 (.80)

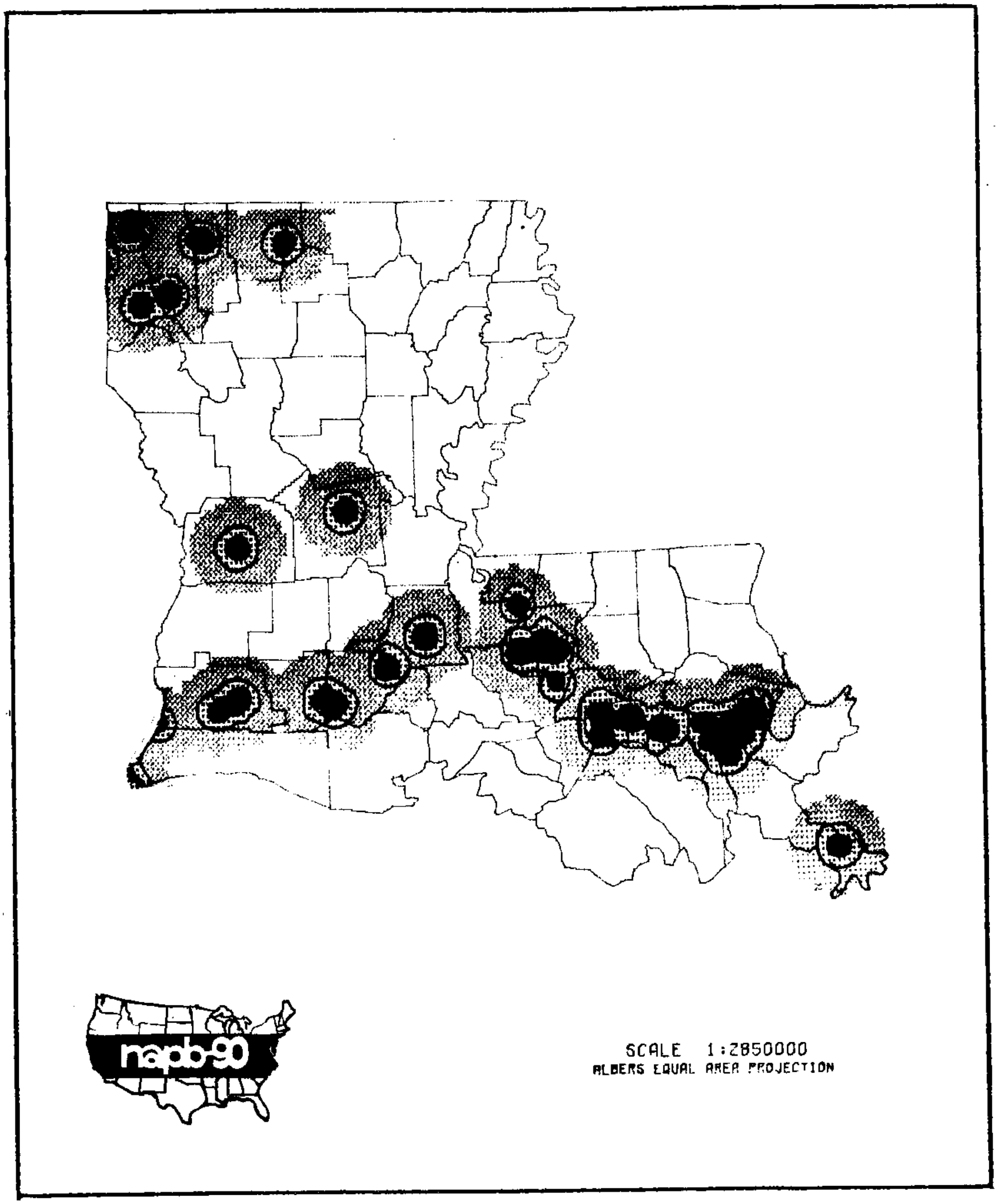
(xxx) Less than 1 percent



DIRECT EFFECTS RISK AREAS

FEMA REGION VI - ARKANSAS

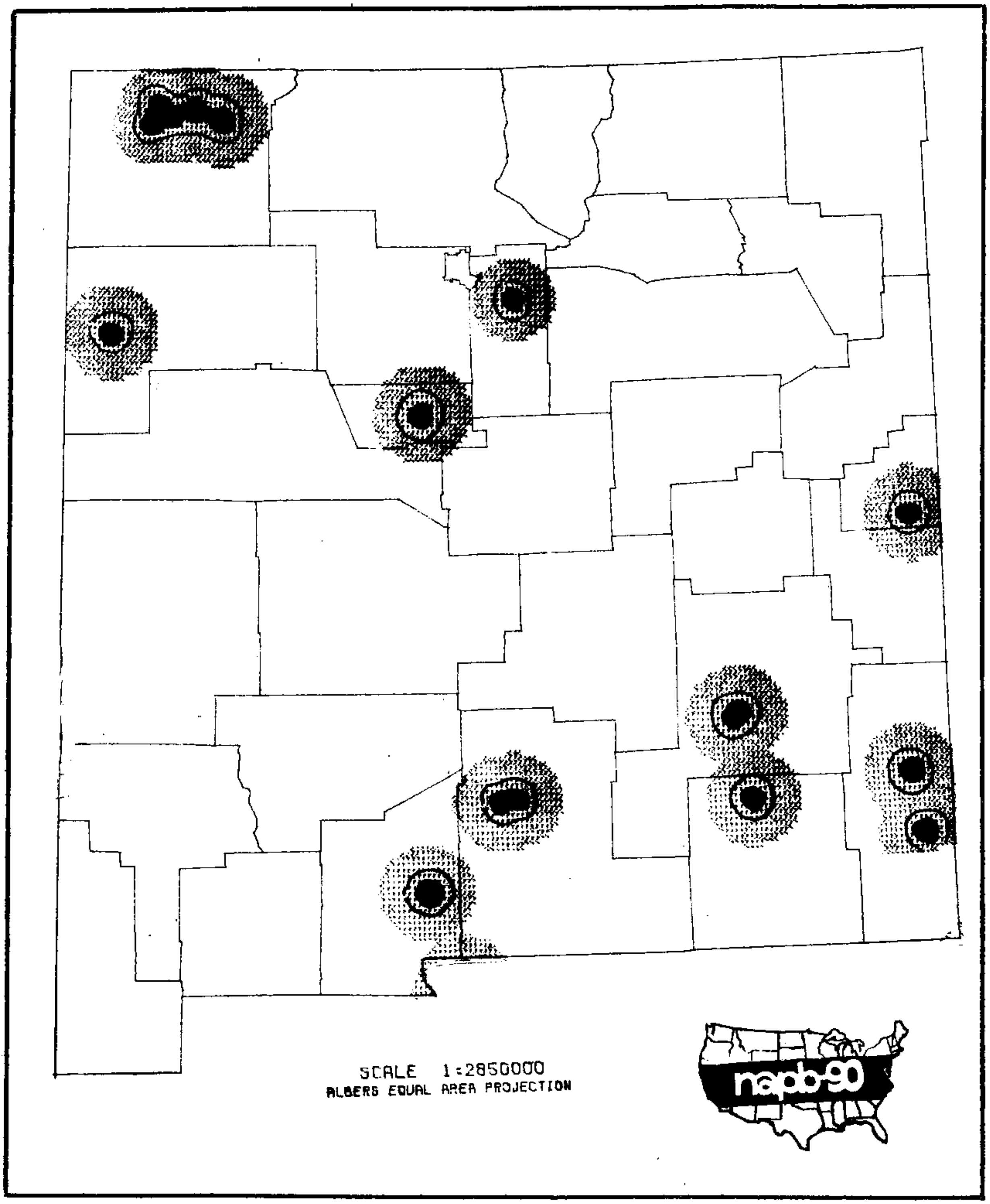
Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION VI - LOUISIANA

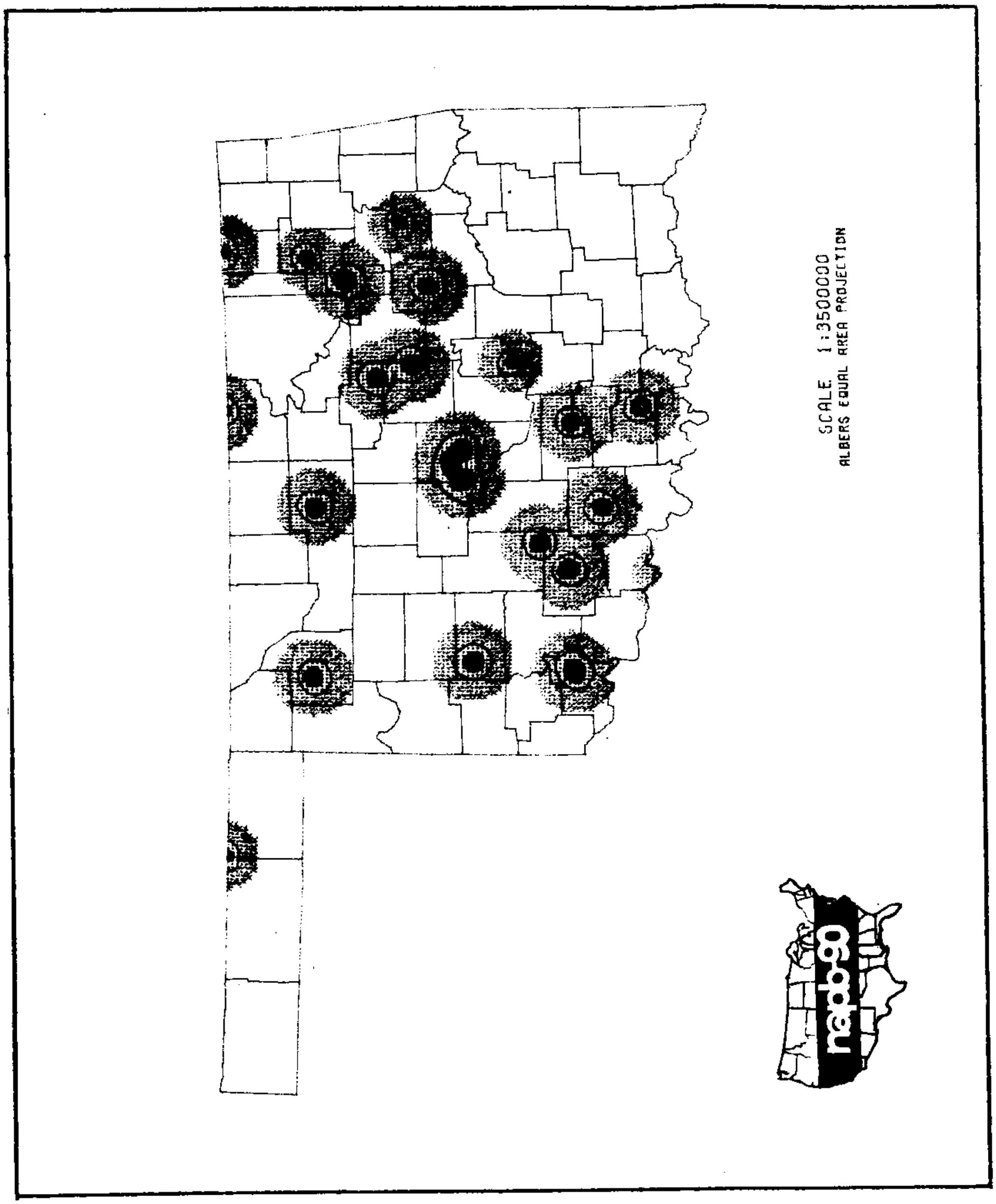
Black Area:	Equal to or greater than 5.0 psi
Ringed Area:	Equal to or greater than 2.0 psi
Unringed Area:	Equal to or greater than 0.5 psi



D I R E C T E F F E C T S R I S K A R E A S

FEMA REGION VI - NEW MEXICO

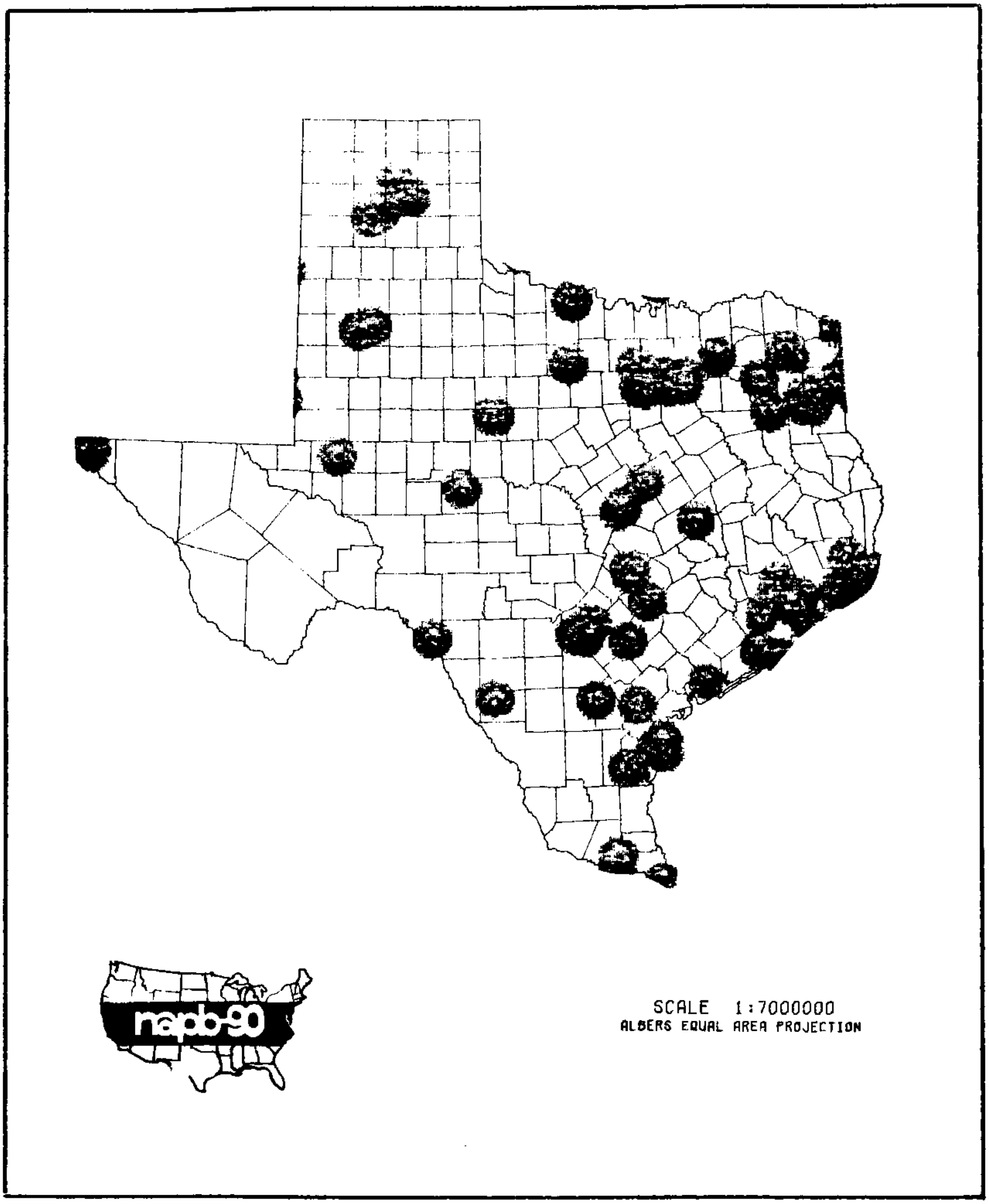
Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION VI - OKLAHOMA

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

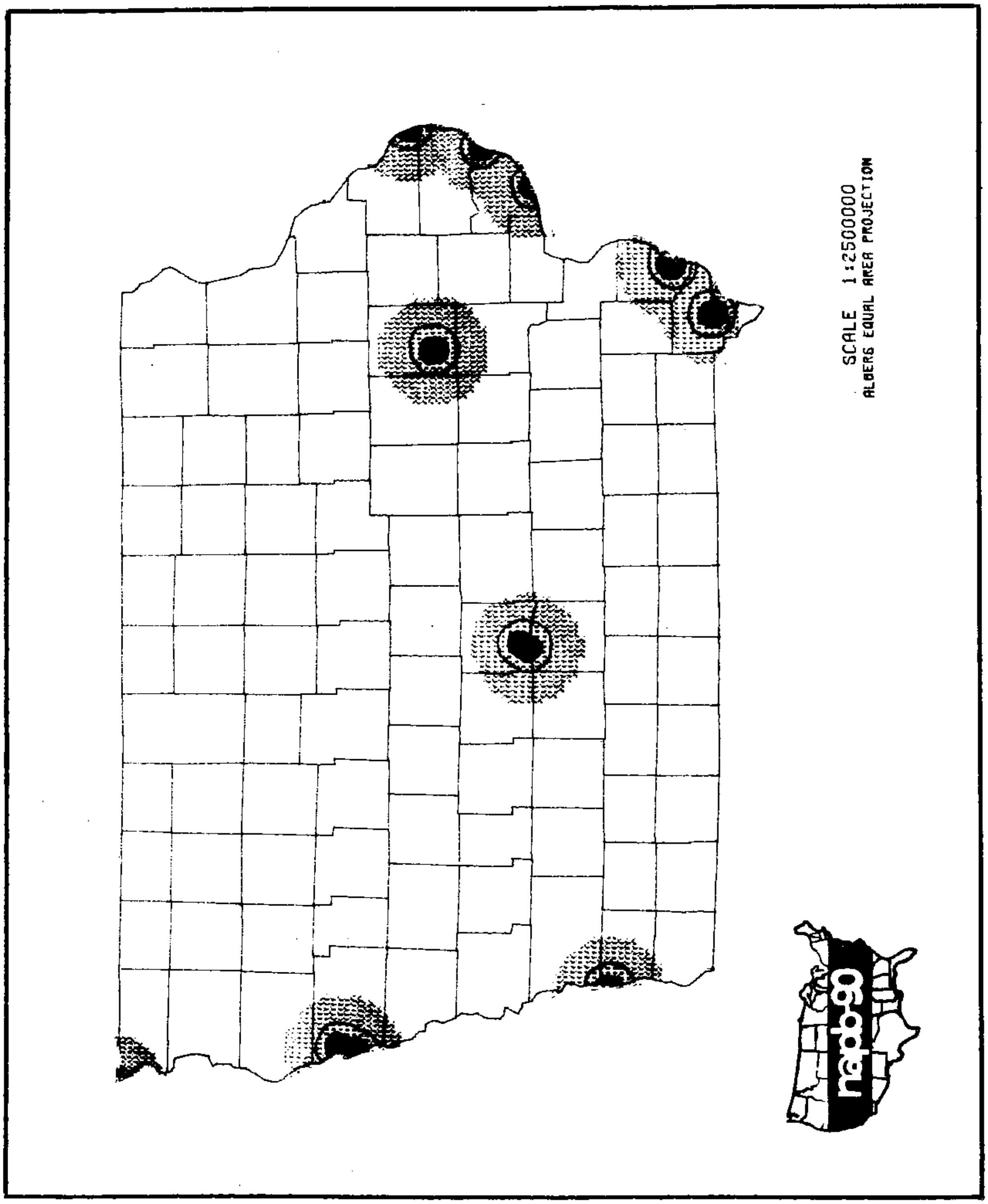
FEMA REGION VI - TEXAS

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

FEMA REGION VII -- DIRECT EFFECTS & FIRE RISKS

STATE/DATA		TOTALS	VERY HIGH Gt 10 psi	HIGH 5 to 10 psi	MEDIUM 2 to 5 psi	LOW .5 to 2 psi	NONE LT .5 psi
IOWA	Population	2906939 (1.00)	226352 (.08)	165728 (.06)	292060 (.10)	338110 (.12)	1884689 (.65)
	Land Area	55964 (1.00)	249 (xxx)	301 (.01)	1153 (.02)	4783 (.09)	49496 (.88)
KANSAS	Population	2454933 (1.00)	453042 (.18)	173379 (.07)	401889 (.16)	541493 (.22)	885130 (.36)
	Land Area	81792 (1.00)	608 (.01)	693 (.01)	2741 (.03)	13420 (.16)	64330 (.79)
MISSOURI	Population	4968558 (1.00)	967727 (.20)	603807 (.12)	936030 (.19)	601981 (.12)	1859013 (.37)
	Land Area	68576 (1.00)	2936 (.04)	2571 (.04)	6247 (.09)	8262 (.13)	48194 (.70)
NEBRASKA	Population	1614811 (1.00)	171719 (.11)	78721 (.05)	170700 (.11)	449803 (.28)	743868 (.46)
	Land Area	76639 (1.00)	878 (.01)	1148 (.01)	3322 (.04)	5454 (.07)	65837 (.86)
REGION VII	Population	11925241 (1.00)	1818840 (.15)	1021635 (.09)	1827679 (.15)	1931387 (.16)	5325700 (.45)
	Land Area	282971 (1.00)	4671 (.02)	4713 (.02)	13463 (.05)	31919 (.11)	227857 (.81)

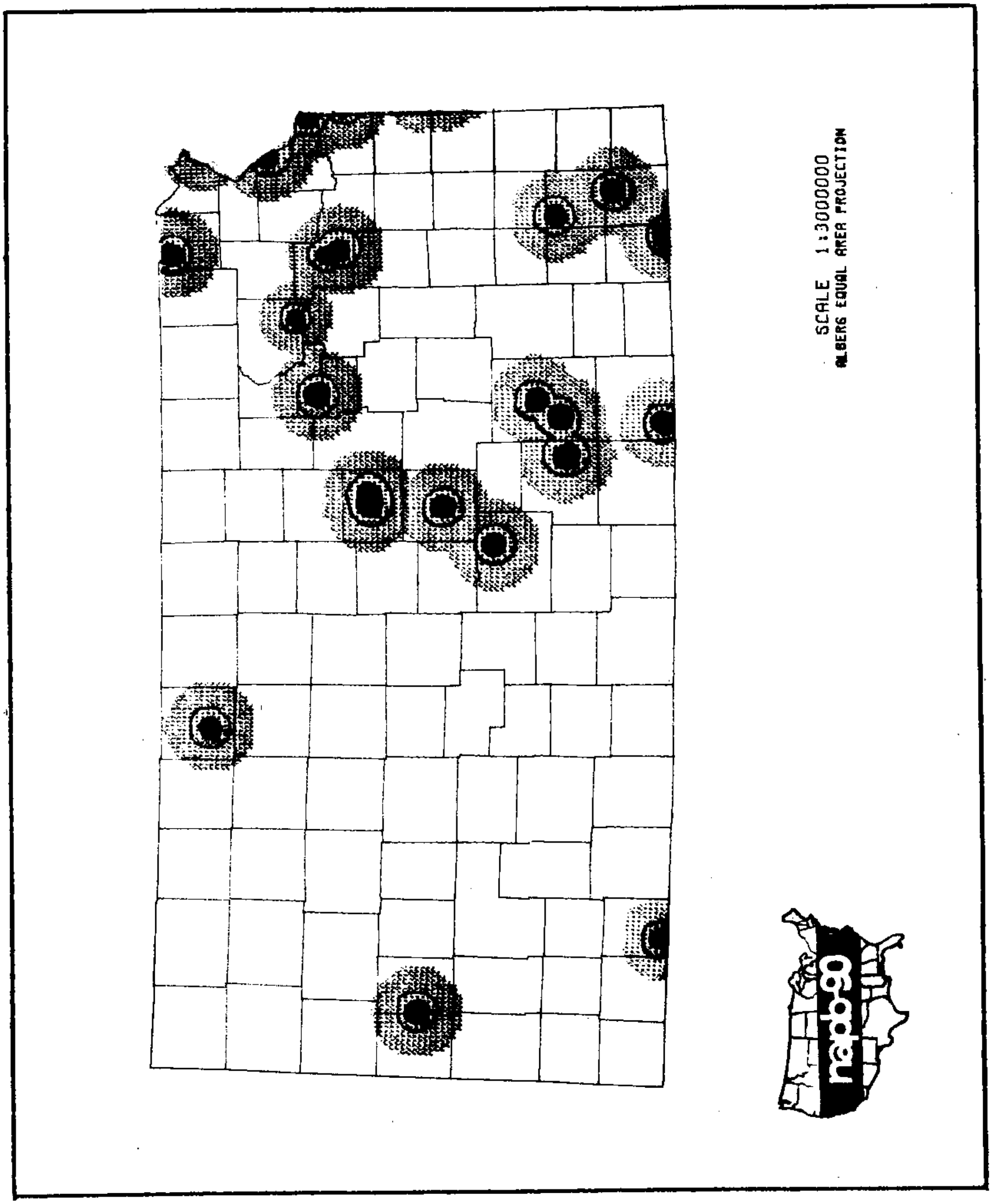
(xxx) Less than 1 percent



DIRECT EFFECTS RISK AREAS

FEMA REGION VII - IOWA

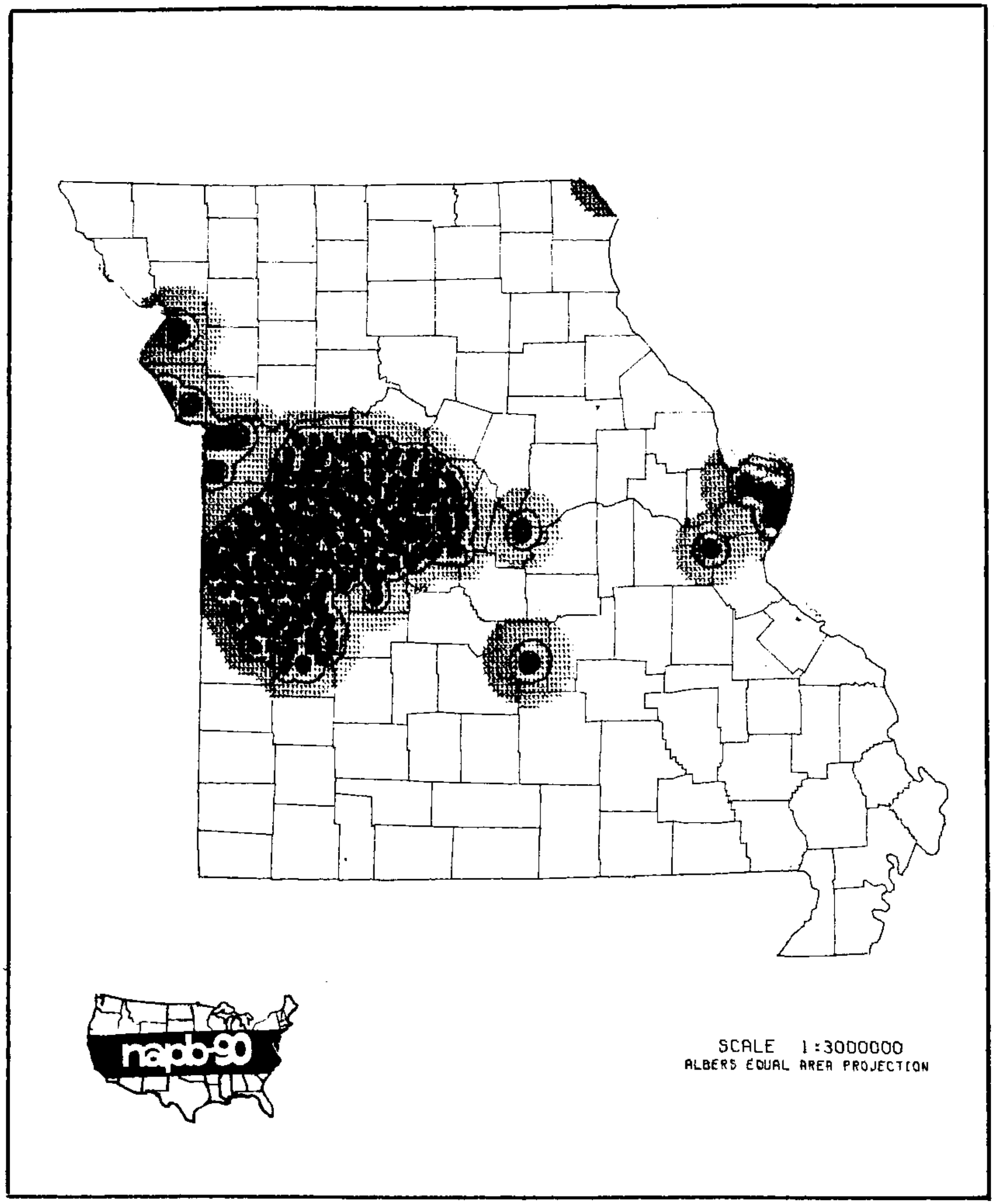
Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION VII - KANSAS

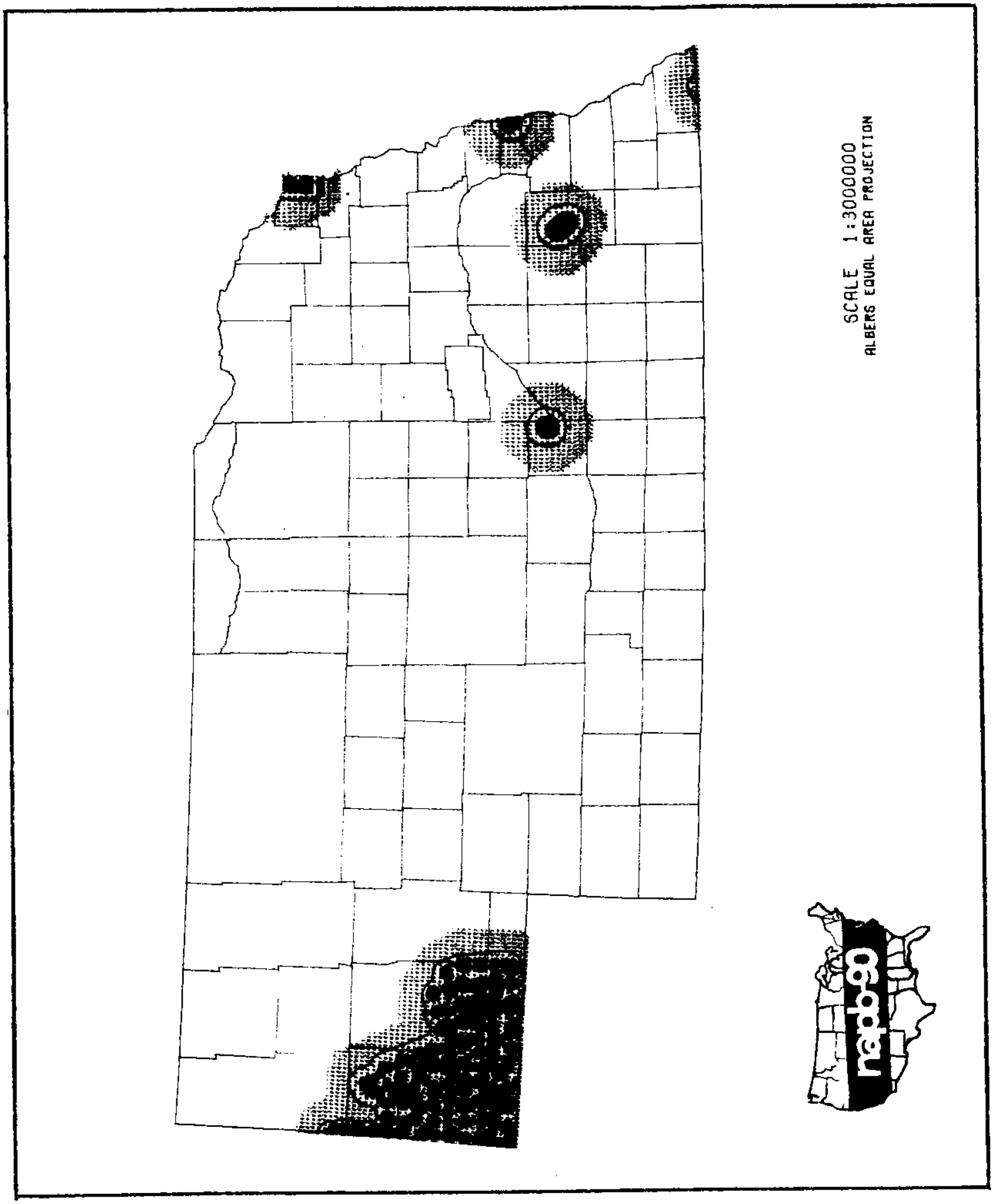
Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION VII - MISSOURI

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

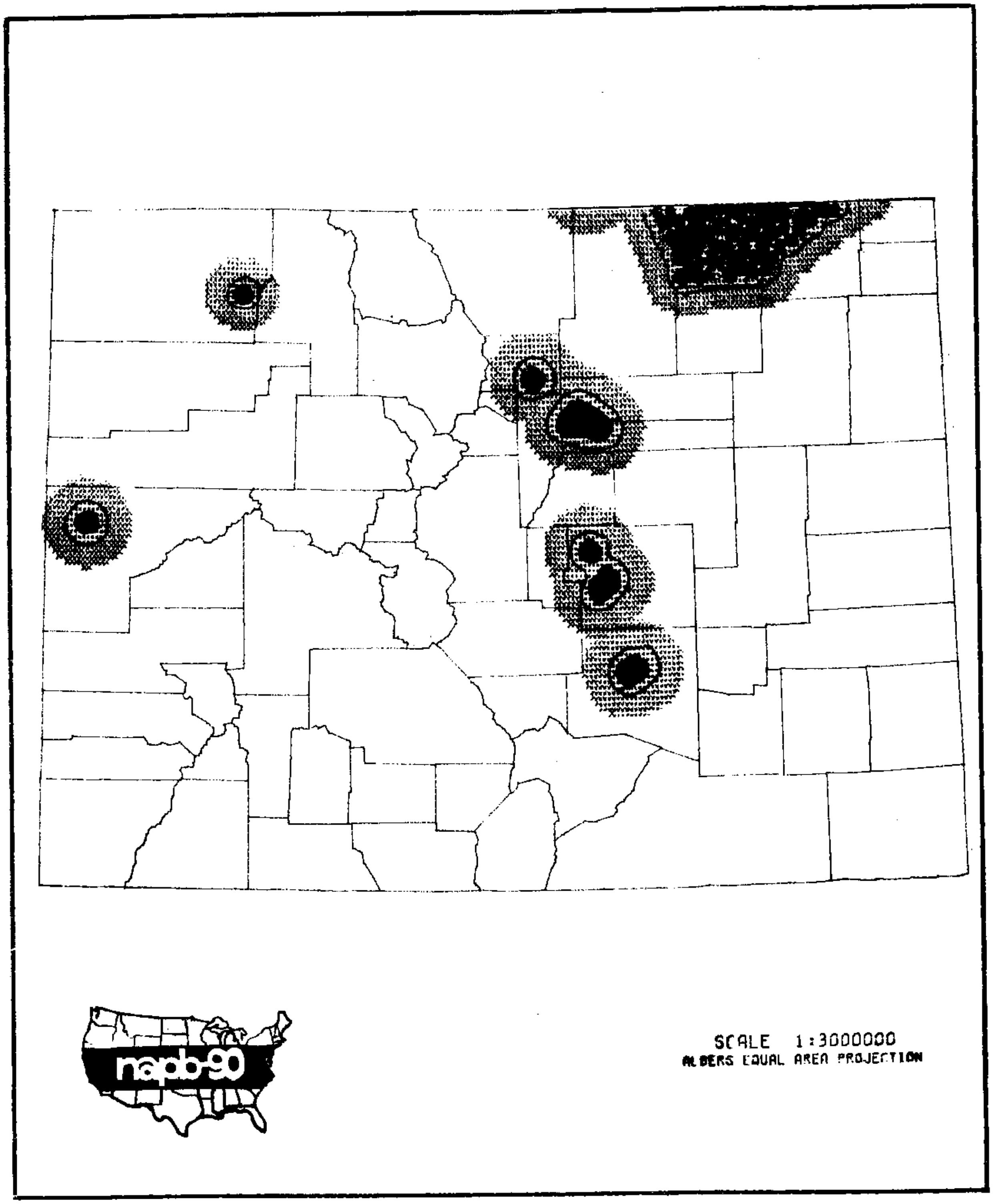
FEMA REGION VII - NEBRASKA

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

F E M A   R E G I O N   V I I I -- D I R E C T   E F F E C T S & F I R E   R I S K S

STATE/DATA		TOTALS	VERY HIGH GT 10 psi	HIGH 5 to 10 psi	MEDIUM 2 to 5 psi	LOW .5 to 2 psi	NONE LT .5 psi
COLORADO	Population	3250118 (1.00)	757230 (.23)	369050 (.11)	641107 (.20)	648655 (.20)	834076 (.26)
	Land Area	103652 (1.00)	883 (.01)	1043 (.01)	2777 (.03)	174 (xxx)	98775 (.95)
MONTANA	Population	832872 (1.00)	216472 (.27)	72913 (.08)	56899 (.07)	36289 (.05)	450299 (.53)
	Land Area	145365 (1.00)	3190 (.02)	3107 (.02)	10943 (.08)	19123 (.13)	109002 (.75)
NORTH DAKOTA	Population	697576 (1.00)	185802 (.27)	34321 (.04)	84588 (.11)	115679 (.17)	277186 (.40)
	Land Area	69344 (1.00)	5581 (.08)	5322 (.08)	9262 (.13)	15770 (.23)	33409 (.48)
SOUTH DAKOTA	Population	708728 (1.00)	92921 (.13)	27469 (.04)	58215 (.08)	76474 (.11)	453649 (.63)
	Land Area	75956 (1.00)	2687 (.04)	2434 (.03)	5321 (.07)	7802 (.10)	57732 (.76)
UTAH	Population	1698867 (1.00)	332028 (.19)	506954 (.30)	318150 (.19)	243378 (.14)	298357 (.18)
	Land Area	82094 (1.00)	349 (xxx)	582 (.01)	1566 (.02)	6676 (.08)	72921 (.89)
WYOMING	Population	521570 (1.00)	161633 (.31)	51107 (.10)	25544 (.06)	22278 (.04)	261008 (.50)
	Land Area	97086 (1.00)	1428 (.01)	1720 (.02)	4581 (.05)	10950 (.11)	78407 (.81)
REGION VIII	Population	7709731 (1.00)	1746086 (.23)	1061814 (.14)	1184503 (.15)	1143293 (.15)	2574035 (.33)
	Land Area	573497 (1.00)	14118 (.02)	14208 (.02)	34450 (.06)	60495 (.11)	450246 (.79)

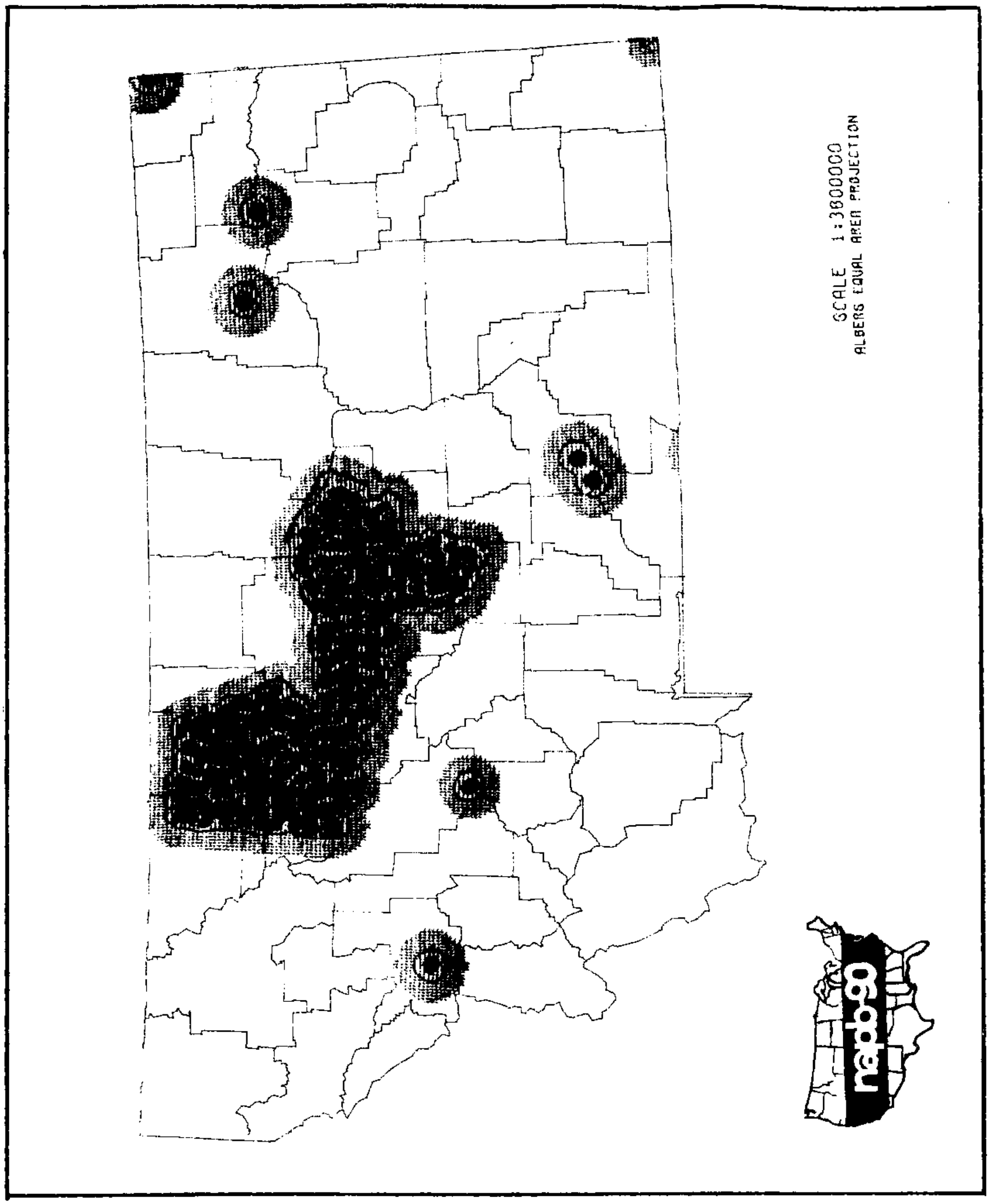
(xxx) Less than 1 percent



DIRECT EFFECTS RISK AREAS

FEMA REGION VIII - COLORADO

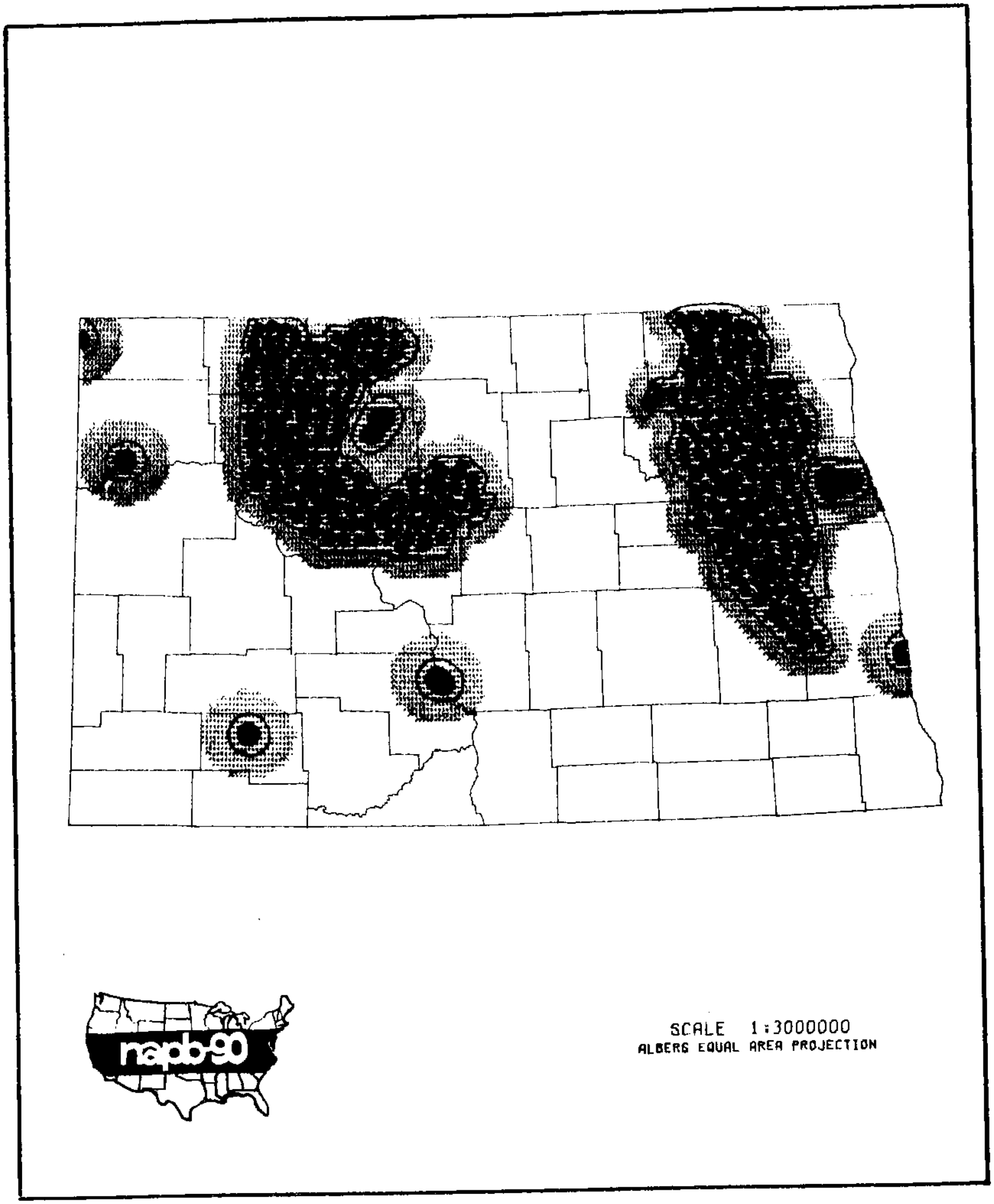
Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



D I R E C T   E F F E C T S   R I S K   A R E A S

FEMA REGION VIII - MONTANA

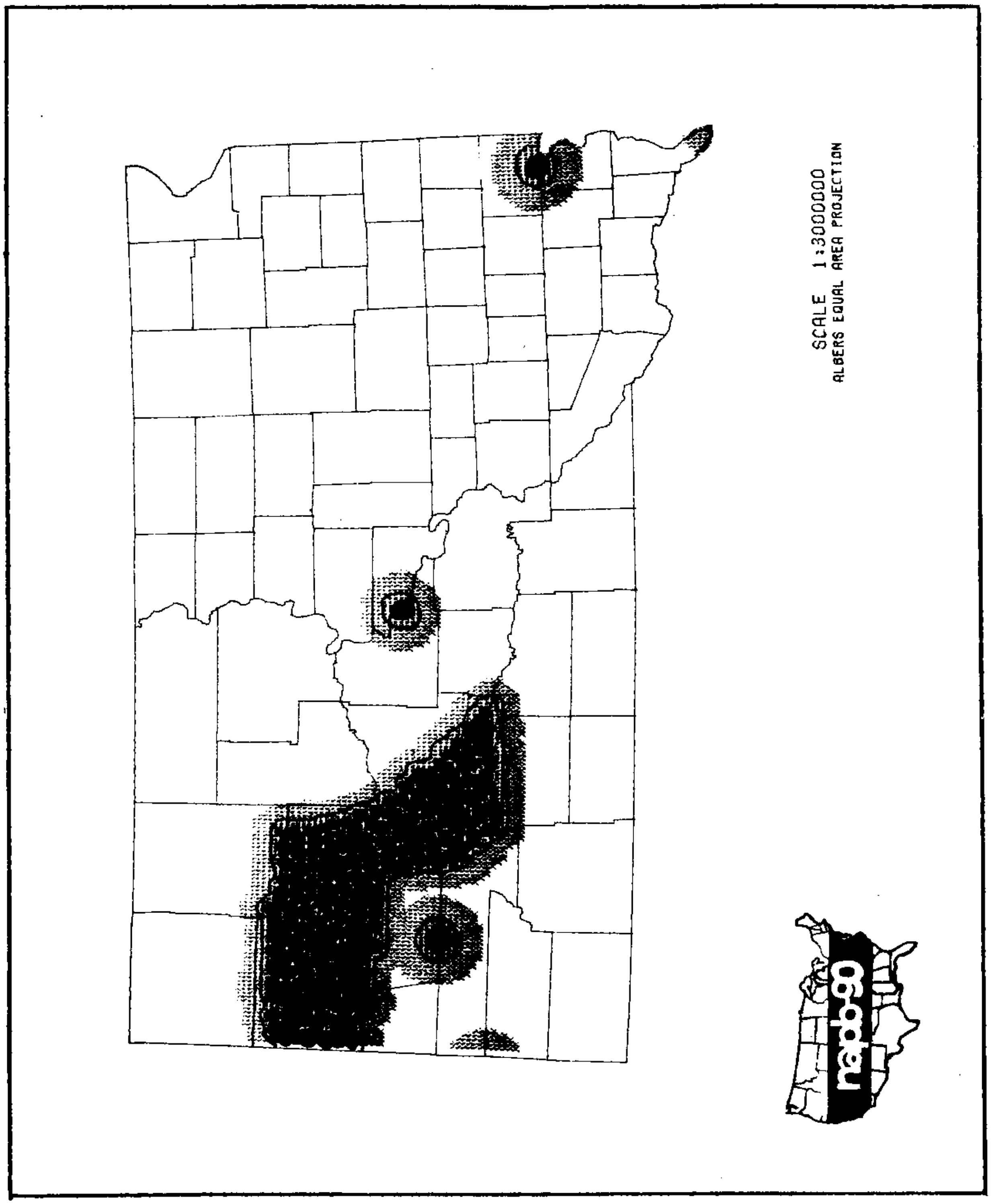
Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION VIII - NORTH DAKOTA

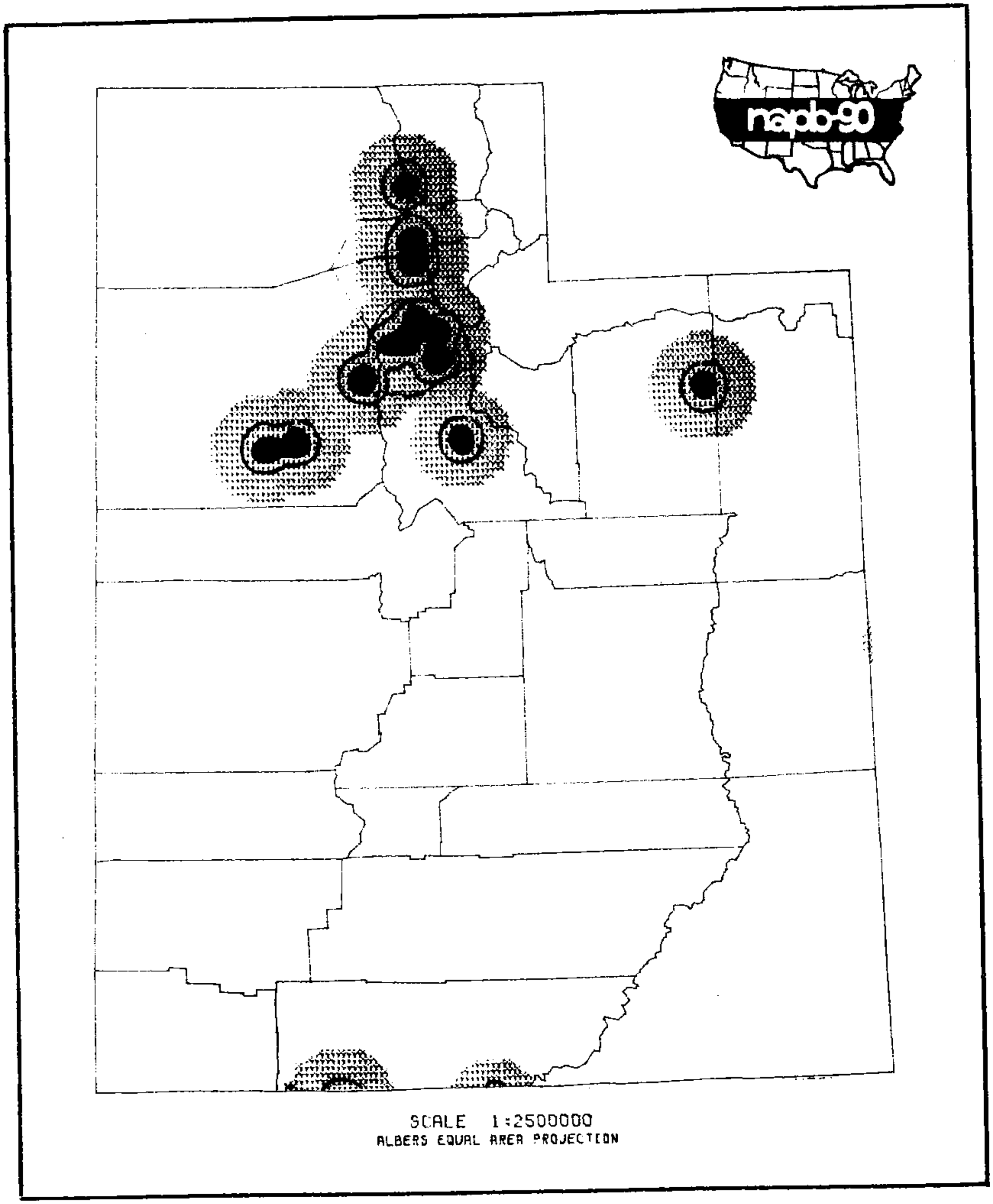
Black Area:	Equal to or greater than 5.0 psi
Ringed Area:	Equal to or greater than 2.0 psi
Unringed Area:	Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION VIII - SOUTH DAKOTA

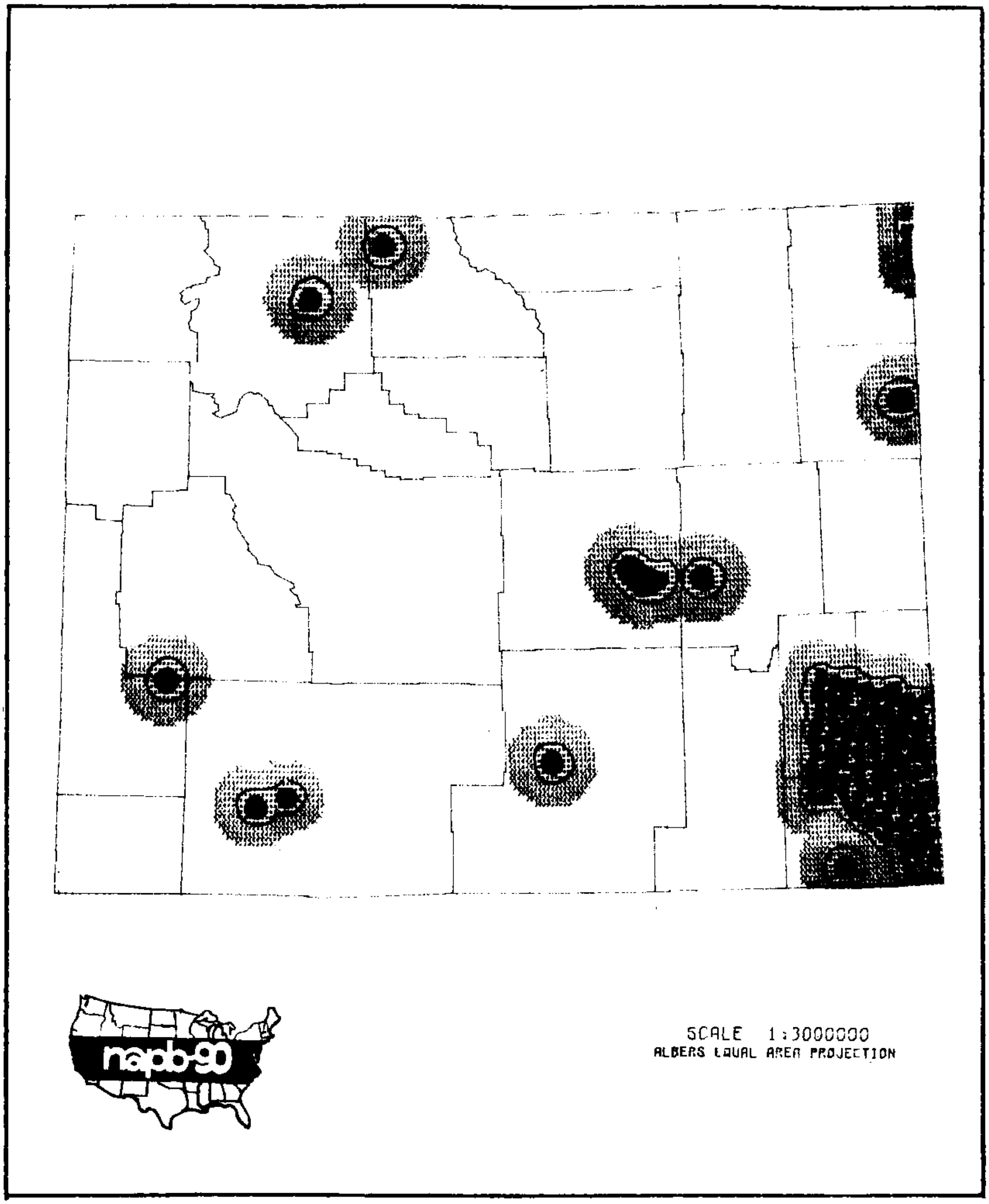
Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION VIII - UTAH

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

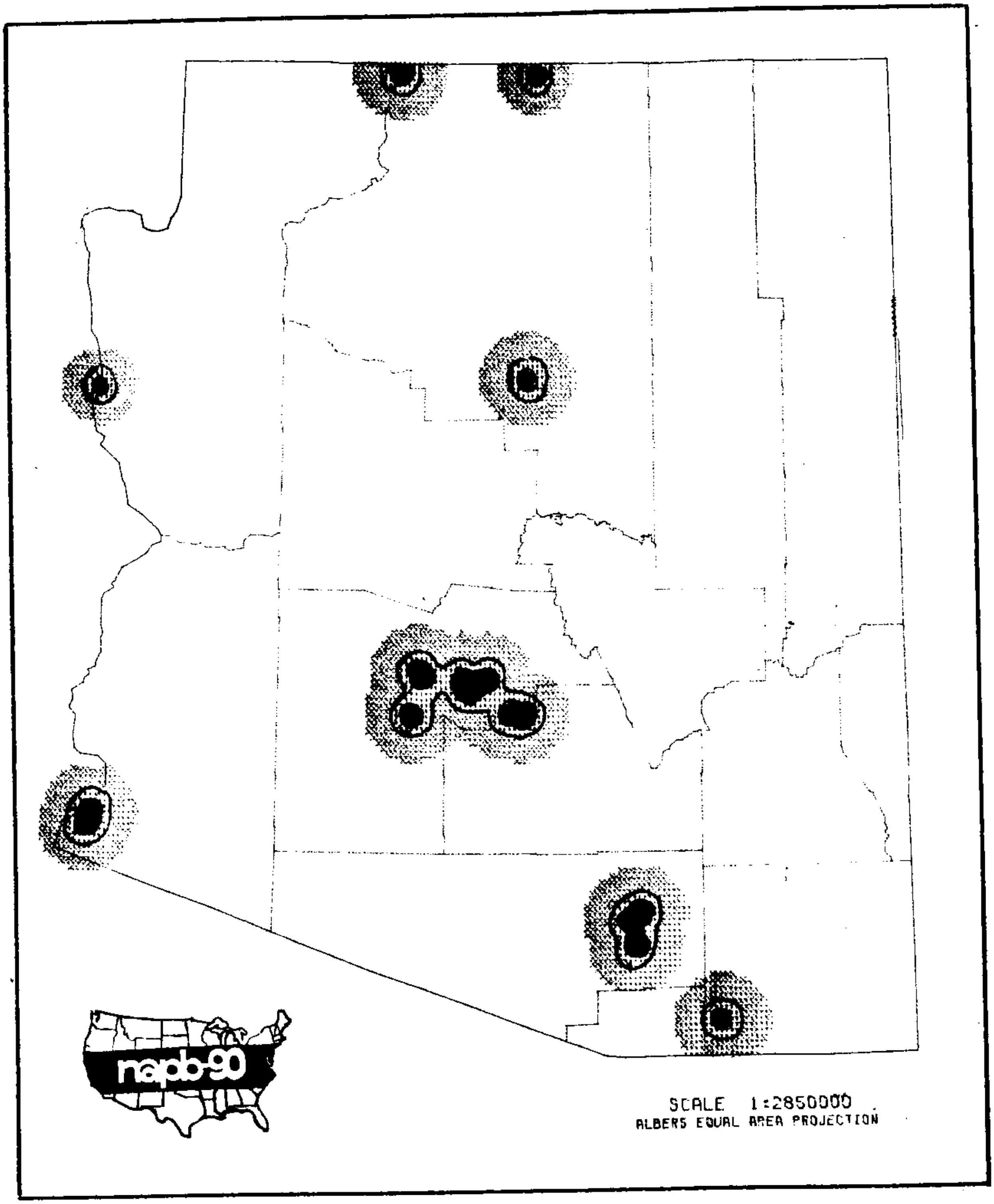
FEMA REGION VIII - WYOMING

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

FEMA REGION IX -- DIRECT EFFECTS & FIRE RISKS

STATE/DATA		TOTALS	VERY HIGH GT 10 psi	HIGH 5 to 10 psi	MEDIUM 2 to 5 psi	LOW .5 to 2 psi	NONE LT .5 psi
ARIZONA	Population	3138988 (1.00)	583952 (.18)	384090 (.12)	1105668 (.35)	469613 (.15)	595665 (.19)
	Land Area	113550 (1.00)	640 (.01)	503 (xxx)	2158 (.02)	7713 (.07)	102536 (.90)
CALIFORNIA	Population	26105844 (1.00)	8712562 (.33)	4797722 (.03)	6871350 (.26)	3085422 (.12)	2638788 (.10)
	Land Area	156279 (1.00)	3550 (.02)	3015 (.02)	9527 (.06)	36501 (.23)	103686 (.66)
HAWAII	Population	1057270 (1.00)	327778 (.31)	105940 (.10)	186162 (.18)	250400 (.24)	186990 (.17)
	Land Area	6427 (1.00)	* *	* *	* *	* *	* *
NEVADA	Population	938191 (1.00)	249851 (.27)	159296 (.17)	312581 (.33)	112158 (.12)	104305 (.12)
	Land Area	109895 (1.00)	328 (xxx)	365 (xxx)	1402 (xxx)	6226 (.06)	101574 (.92)
SAMOA	Population	35000 (1.00)	* *	* *	* *	* *	* *
	Land Area	77 (1.00)	* *	* *	* *	* *	* *
GUAM	Population	112900 (1.00)	* *	* *	* *	* *	* *
	Land Area	209 (1.00)	* *	* *	* *	* *	* *
TRUST TERR.	Population	116149 (1.00)	* *	* *	* *	* *	* *
	Land Area	533 (1.00)	* *	* *	* *	* *	* *
REGION IX	Population	31504342 (1.00)	9874143 (.31)	5447048 (.17)	8475761 (.27)	3917593 (.12)	3789797 (.09)
	Land Area	386970 (1.00)	4518 (.01)	3883 (.01)	13087 (.03)	50440 (.13)	323363 (.84)

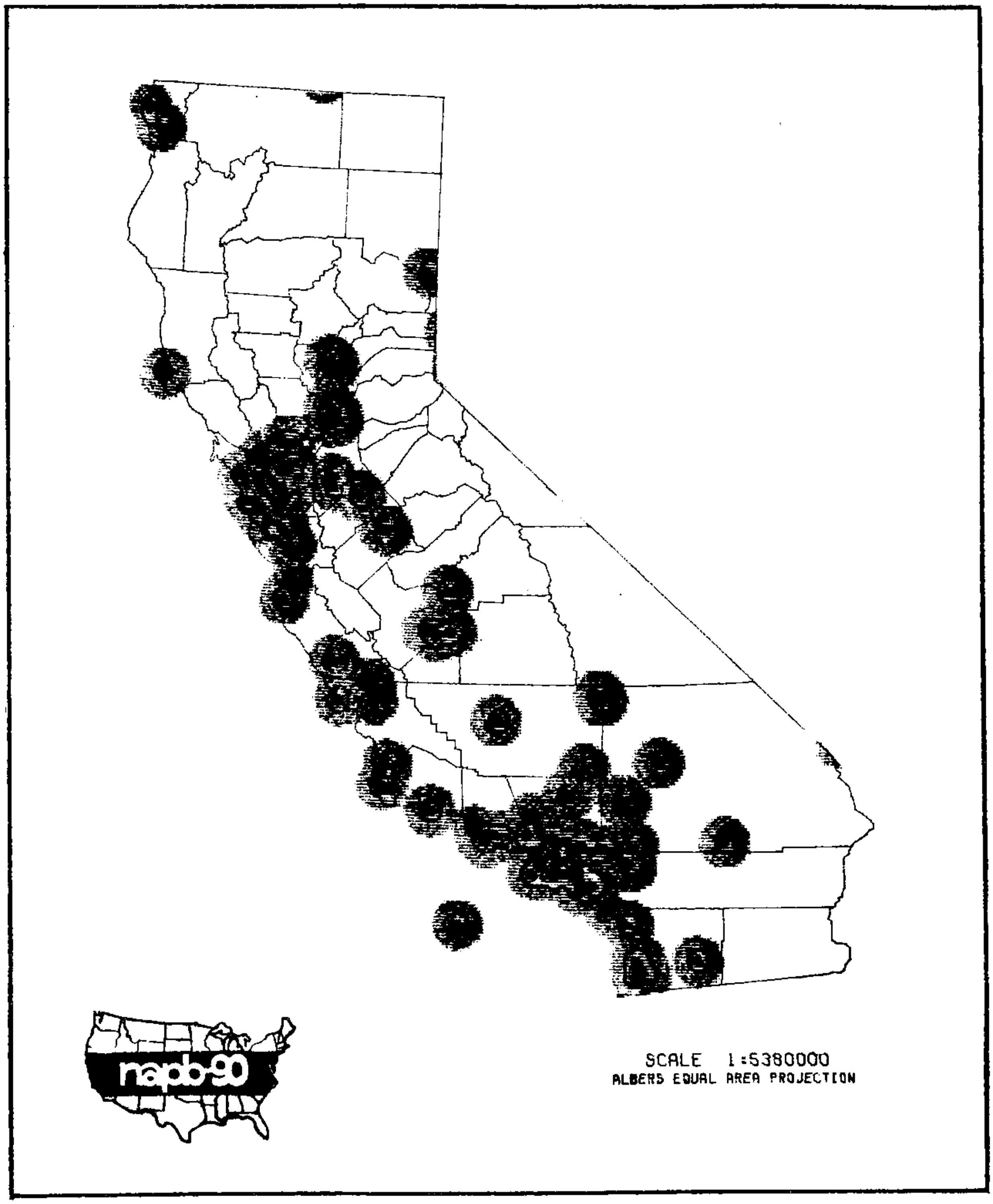
(xxx) Less than one percent
* Data will be made available seperately



DIRECT EFFECTS RISK AREAS

FEMA REGION IX - ARIZONA

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



D I R E C T   E F F E C T S   R I S K   A R E A S

FEMA REGION IX - CALIFORNIA

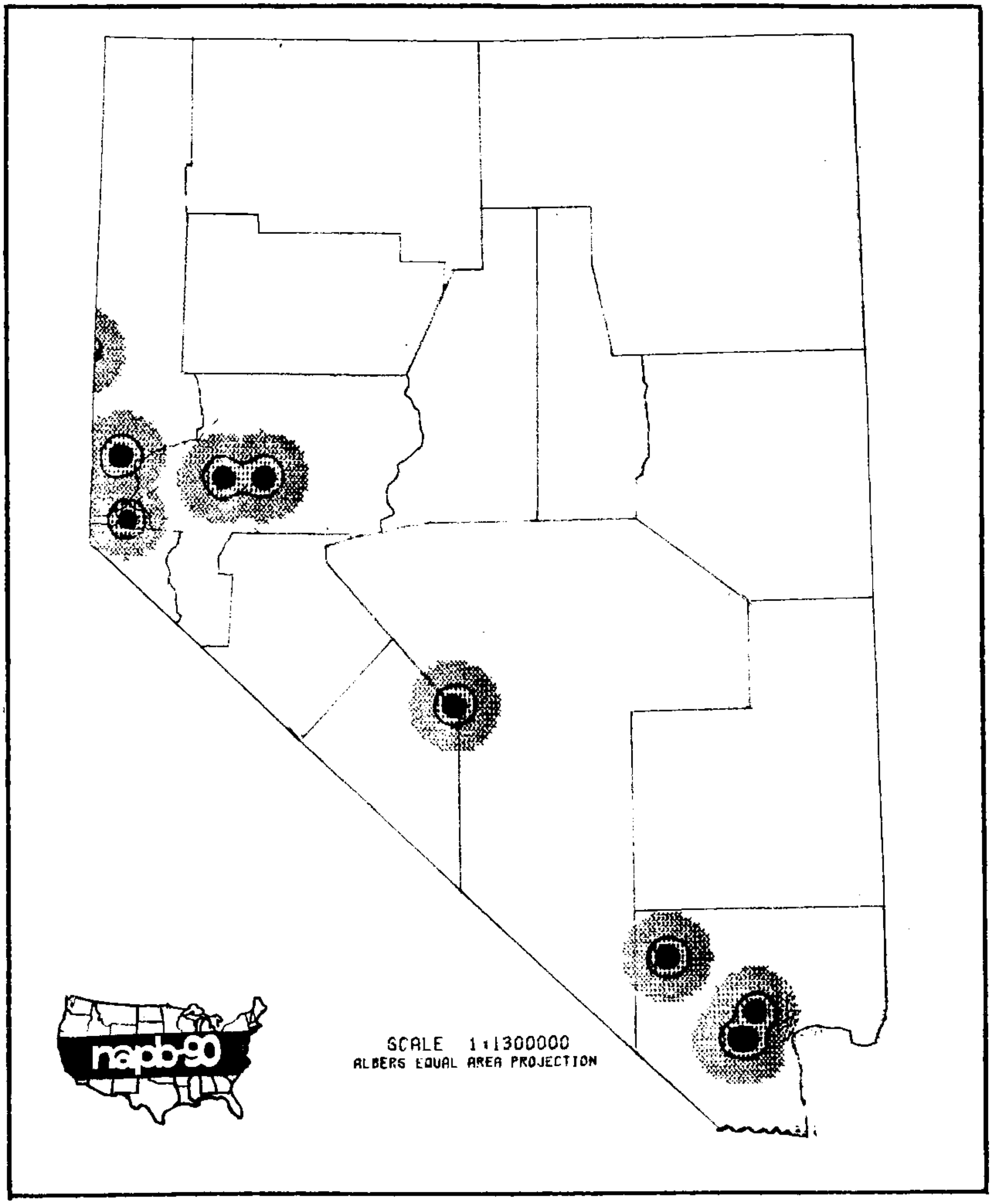
Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

[MAP WILL BE FURNISHED SEPARATELY]

DIRECT EFFECTS RISK AREAS

FEMA REGION IX - HAWAII

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION IX - NEVADA

Black Area:	Equal to or greater than 5.0 psi
Ringed Area:	Equal to or greater than 2.0 psi
Unringed Area:	Equal to or greater than 0.5 psi

[MAP WILL BE FURNISHED SEPARATELY]

DIRECT EFFECTS RISK AREAS

FEMA REGION IX - AMERICAN SAMOA

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

[MAP WILL BE FURNISHED SEPARATELY]

DIRECT EFFECTS RISK AREAS

FEMA REGION IX - GUAM

Black Area:	Equal to or greater than 5.0 psi
Ringed Area:	Equal to or greater than 2.0 psi
Unringed Area:	Equal to or greater than 0.5 psi

[MAP WILL BE FURNISHED SEPARATELY]

DIRECT EFFECTS RISK AREAS

FEMA REGION IX - U.S. TRUST TERRITORY

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

F E M A   R E G I O N   X -- D I R E C T   E F F E C T S & F I R E   R I S K S

STATE/DATA		TOTALS	VERY HIGH GT 10 psi	HIGH 5 to 10 psi	MEDIUM 2 to 5 psi	LOW .5 to 2 psi	NONE LT .5 psi
ALASKA	Population	534271 (1.00)	38557 (.08)	54897 (.09)	102153 (.19)	55463 (.11)	283201 (.53)
	Land Area	570833 (1.00)	* *	* *	* *	* *	* *
IDAHO	Population	1014218 (1.00)	114528 (.11)	74583 (.07)	108834 (.11)	126655 (.13)	589618 (.58)
	Land Area	82414 (1.00)	90 (xxx)	259 (xxx)	836 (.01)	5110 (.06)	76119 (.92)
OREGON	Population	2683926 (1.00)	351689 (.13)	162186 (.06)	369500 (.14)	527477 (.20)	1273074 (.40)
	Land Area	96187 (1.00)	317 (xxx)	318 (xxx)	1375 (.01)	6375 (.07)	87802 (.91)
WASHINGTON	Population	4402272 (1.00)	1049095 (.24)	516498 (.12)	809564 (.18)	1239731 (.05)	787384 (.18)
	Land Area	66512 (1.00)	957 (.01)	937 (.01)	3618 (.05)	15384 (.23)	45616 (.69)
REGION X	Population	8634750 (1.00)	1553869 (.18)	808164 (.09)	1390051 (.16)	1949326 (.23)	2933340 (.34)
	Land Area	815946 (1.00)	1364 (xxx)	1514 (xxx)	5829 (.01)	26869 (.03)	780370 (.96)

(xxx) Less than 1 percent

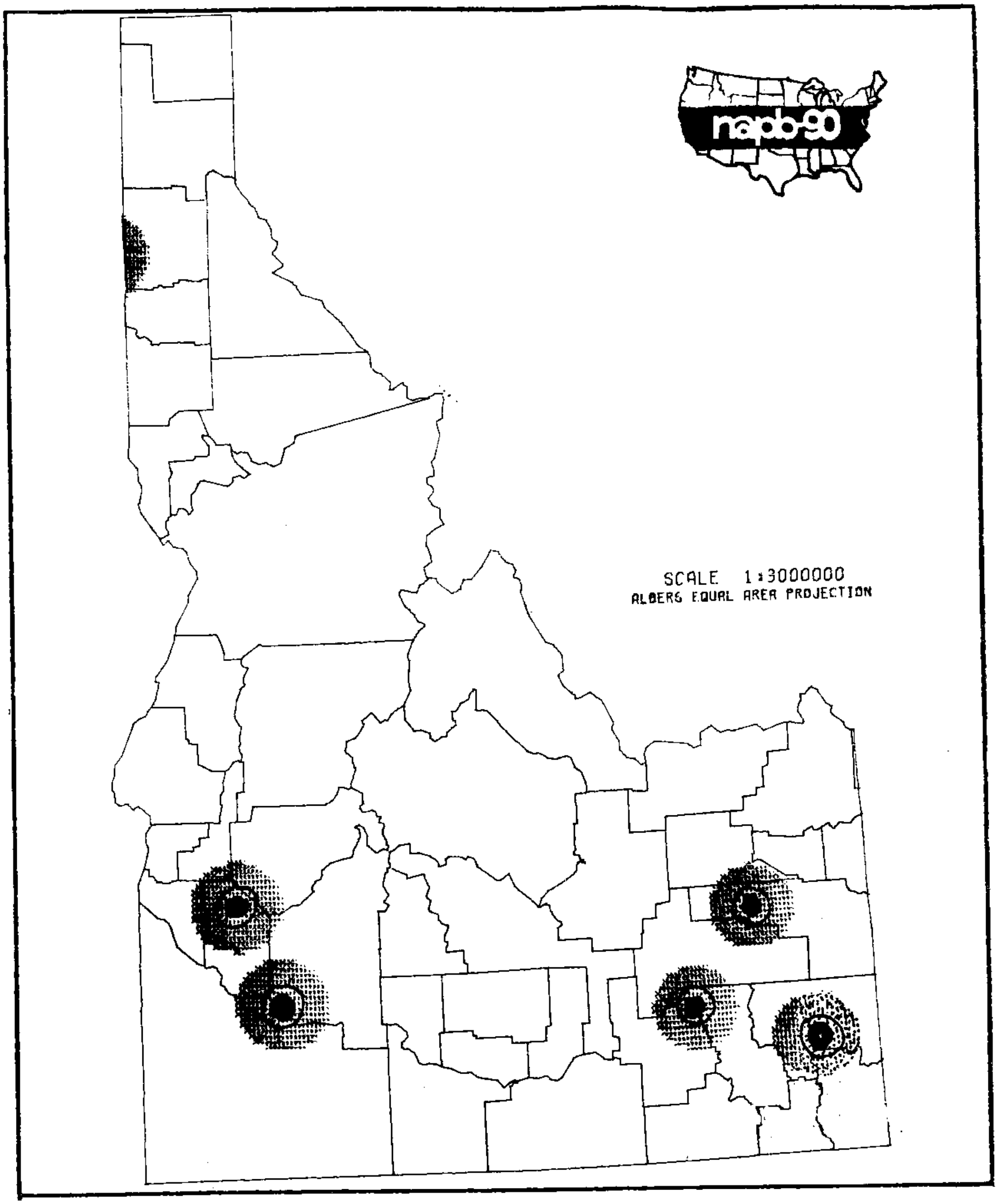
* Data will be made available separately

[MAP WILL BE FURNISHED SEPARATELY]

DIRECT EFFECTS RISK AREAS

FEMA REGION X - ALASKA

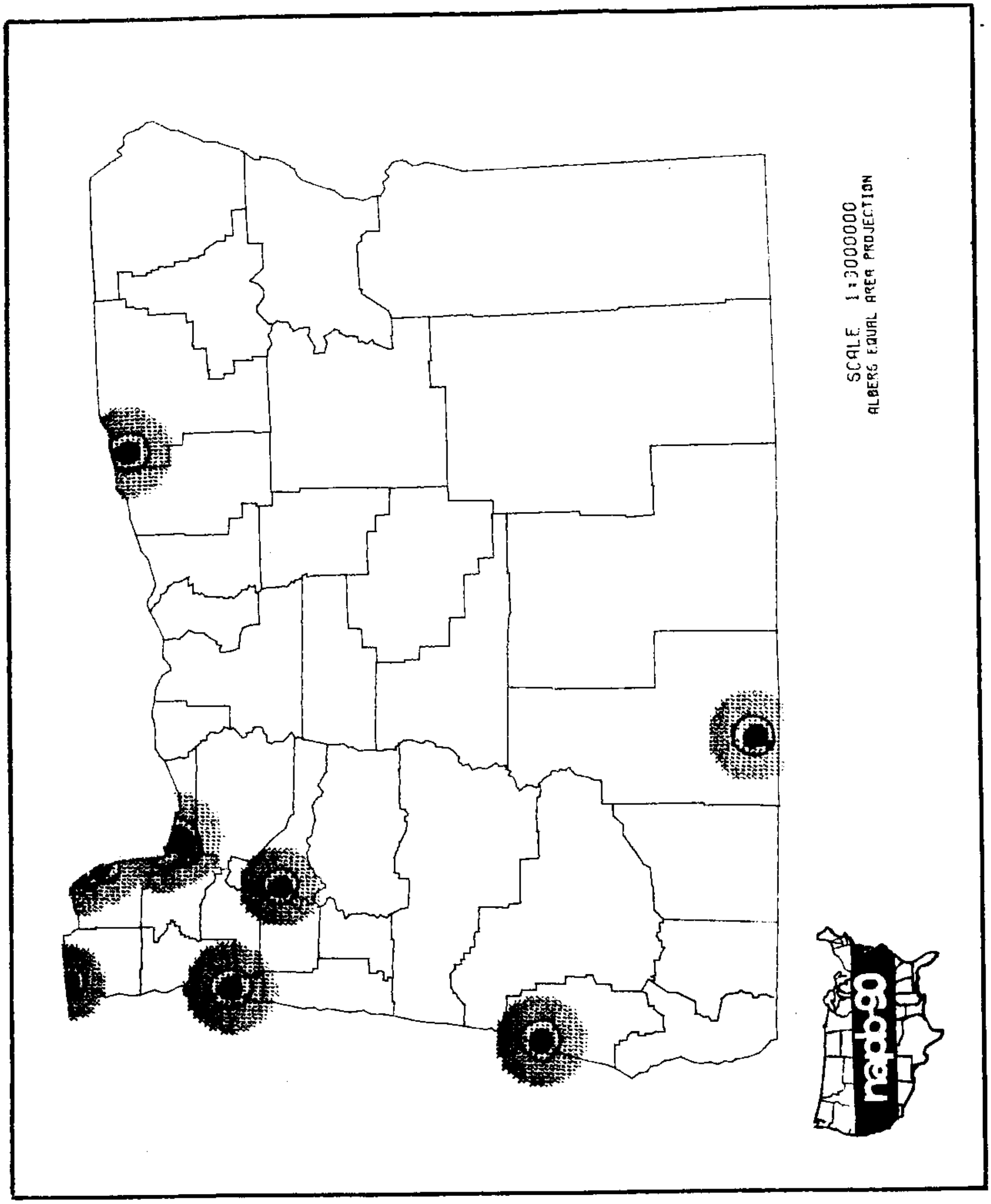
Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION X - IDAHO

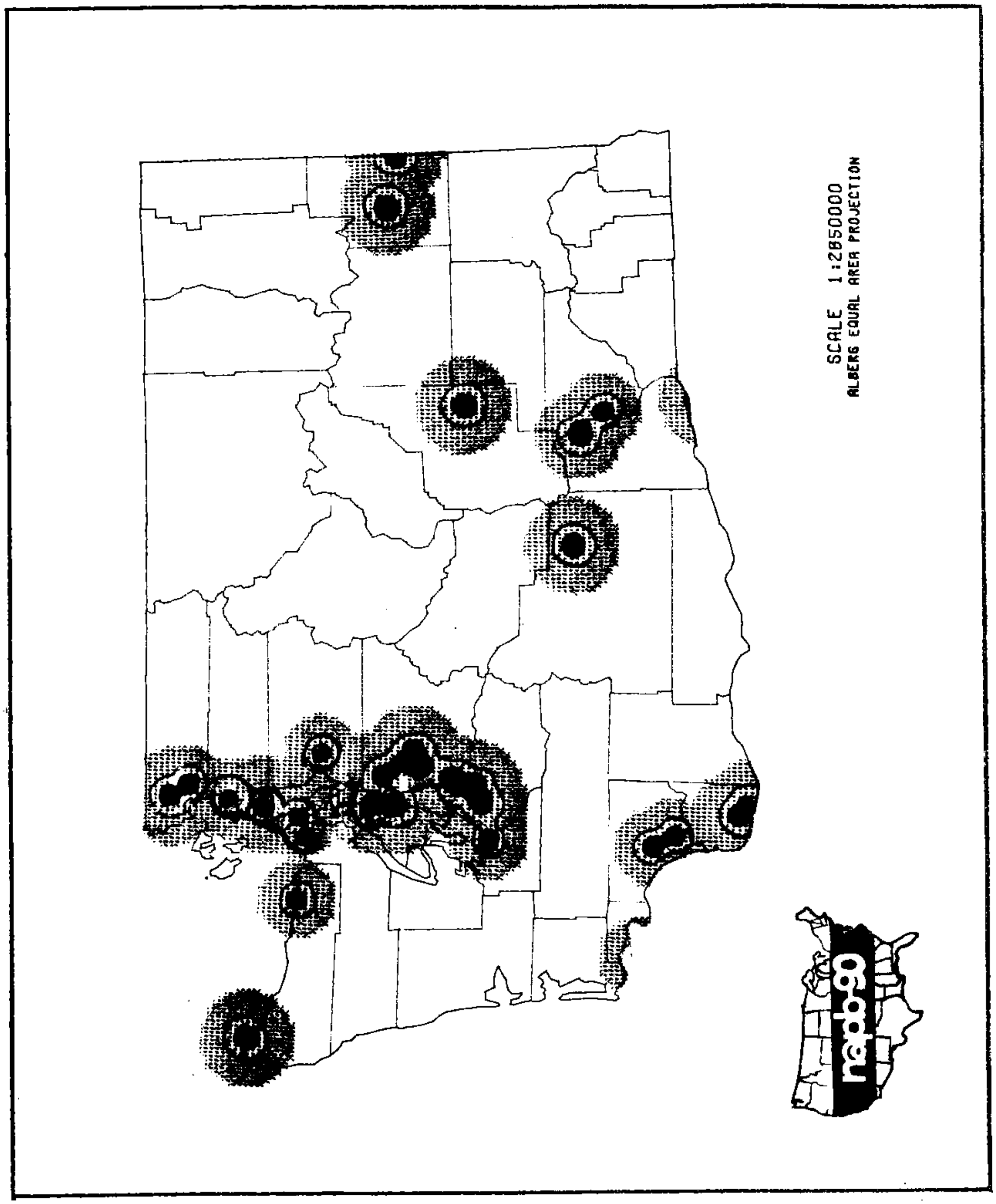
Black Area:	Equal to or greater than 5.0 psi
Ringed Area:	Equal to or greater than 2.0 psi
Unringed Area:	Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION X - OREGON

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi



DIRECT EFFECTS RISK AREAS

FEMA REGION X - WASHINGTON

Black Area: Equal to or greater than 5.0 psi
Ringed Area: Equal to or greater than 2.0 psi
Unringed Area: Equal to or greater than 0.5 psi

ANNEX A - DIRECT EFFECTS & FIRE RISKS

PART 2. HIGHEST RISK LEVEL RECORDED WITHIN COUNTIES

This part shows county resident population and land area under direct effects and fire risk based upon the highest risk level recorded within the county, regardless of the actual area covered by blast. This data also includes counties which are "risk free" from blast overpressures, i.e., counties which have no blast overpressure or have blast overpressure less than 0.5 psi.

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N A T I O N A L   D I R E C T   E F F E C T S   R I S K   S U M M A R Y

Estimated 1985 Population: 242,109,419
Land Area: 3,551,226 square miles

	VERY HIGH RISK GT 10 PSI		HIGH RISK EQ/GT 5PSI LT 10PSI		MEDIUM RISK EQ/GT 2PSI LT 5PSI		LOW/NO* RISK EQ/GT .5PSI LT 2PSI	
FEMA REGION	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Region I	9 397 810	22 101	206 694	4 540	1 025 945	3 408	1 816 758	31 633
							(688 758	9 688)
							(1 127 971	21 945)*
Region II	19 525 466	18 641	5 734 729	3 850	998 669	9 112	943 560	23 242
							(768 558	8 451)
							(175 002	14 791)*
Region III	18 606 721	43 296	825 473	6 116	1 790 474	13 521	3 838 890	57 614
							(2 307 493	31 393)
							(1 531 397	26 224)*
Region IV	22 990 579	83 093	976 474	11 723	2 403 465	25 471	16 072 187	258 813
							(6 109 444	105 673)
							(9 962 743	153 140)*
Region V	26 087 828	66 623	1 254 413	6 384	4 011 018	28 005	14 333 828	222 533
							(6 300 432	63 473)
							(8 033 396	159 060)*
Region VI	18 774 323	125 298	237 848	5 128	1 653 608	38 036	7 474 583	380 121
							(2 847 548	98 679)
							(4 627 035	281 442)*
Region VII	5 647 754	42 351	379 225	6 244	951 181	10 350	4 967 080	224 026
							(1 054 037	41 287)
							(3 913 043	182 739)*

* Less than 0.5 psi overpressure

N A T I O N A L D I R E C T E F F E C T S R I S K S U M M A R Y (Continued)

FEMA REGION	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Region VIII	4 772 181	192 611	469 653	13 816	132 289	25 513	1 944 608	341 557
							(683 017	69 607)
							(1 261 591	271 950)*
Region IX	27 408 451	191 318	---	---	1 354 248	24 772	1 420 324	163 940
							(785 485	34 838)
							(634 839	129 102)*
Region X	5 245 042	62 730	67 460	1 209	701 483	10 305	2 086 494	170 374
							(653 506	35 725)
							(1 432 988	134 649)*
NATIONAL	158 456 155	848 062	10 151 969	59 010	15 022 380	188 493	58 478 645	2 455 661
							(22 198 278	499 814)
							(36 280 367	1 956 847)*

*Less than .5 psi overpressure

FEMA REGION I -- DIRECT EFFECTS RISK SUMMARY

Estimated 1985 Population: 12,320,207
Land Area: 61,682 square miles

STATE	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Connecticut	2 775 954	3 062	---	---	---	---	389 507	1 810
							(389 507	1 810)
							(---	---)*
Maine	637 184	12 292	18 065	3 986	100 112	477	405 517	14 240
							(230 026	7 074)
							(175 491	7 166)*
Massachusetts	4 630 548	3 604	141 781	528	655 822	1 514	75 324	851
							(69 254	804)
							(6 070	47)*
New Hampshire	311 943	1 575	---	---	197 424	1 306	7 481 070	6 111
							(---	---)
							(481 070	6 111)*
Rhode Island	918 987	1 028	46 848	26	---	---	---	---
							(---	---)
							(---	---)*
Vermont	123 194	540	---	---	72 587	1 511	338 704	7 221
							(---	---)
							(338 704	7 221)*
TOTAL REGION I	9 397 810	22 101	206 694	4 540	1 025 945	3 408	1 816 758	31 633
							(688 787	9 688)
							(1 127 971	21 945)*

* Less than .5 psi overpressure

STATE OF CONNECTICUT -- DIRECT EFFECTS RISK

Estimated 1985 Population: 3,165,461
Land Area: 4,872 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Fairfield	818 293	632						
Hartford	819 457	739						
Litchfield							160 885	922
Middlesex							133 498	373
New Haven	771 603	610						
New London	246 137	669						
Tolland	120 464	412						
Windham							95 124	515
TOTAL STATE	2 775 954	3 062	---	---	---	---	389 507	1 810
							(389 507	1 810)
							(---	---)*

* Less than .5 psi overpressure

STATE OF' MAINE -- DIRECT EFFECTS RISK

Estimated 1985 Population: 1,160,878
Land Area: 30,995 square miles

	VERY HIGH RISK GT 10 PSI		HIGH RISK EQ/GT 5PSI LT 10PSI		MEDIUM RISK EQ/GT 2PSI LT 5PSI		LOW/NO* RISK EQ/GT .5PSI LT 2PSI	
COUNTY	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Androscoggin					100 112	477		
Aroostook	88 277	6 721						
Cumberland	225 058	876						
Franklin							29 408	1 699*
Hancock							43 805	1 537
Kennebec							112 723	876
Knos							34 496	370*
Lincoln							27 958	458*
Osford							49 771	2 053*
Penobscot	138 771	3 430						
Piscataquis			18 065	3 986				
Sagadahoc	30 689	257						
Somerset							46 806	3 931
Waldo							26 692	730
Washington							33 858	2 586*
York	154 389	1 008						
STATE TOTAL	637 184	12 292	18 065	3 986	100 112	477	405 517	14 240
							(230 026	7 074)
							(175 491	7 166)*

* Less than .5 psi overpressure

S T A T E O F M A S S A C H U S E T T S -- D I R E C T E F F E C T S R I S K

Estimated 1985 Population: 5,503,475
Land Area: 6,497 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5 PSI LT 2PSI POPULATION	AREA
Barnstable	147 925	400						
Berkshire	145 110	929						
Bristol	478 662	557						
Dukes							10 337	102
Essex	648 793	495						
Franklin							64 987	702
Hampden	442 601	618						
Hampshire			141 781	528				
Middlesex	1 369 905	822						
Nantucket							6 070	47*
Norfolk	602 837	400						
Plymouth	420 708	655						
Suffolk	660 972	57						
Worcester					655 822	1 514		
TOTAL STATE	4 630 548	3 604	141 781	528	655 822	1 514	75 324	851
							(69 254	804)
							(6 070	47)*

*Less than .5 psi overpressure

STATE OF NEW HAMPSHIRE -- DIRECT EFFECTS RISK

Estimated 1985 Population: 990,437
Land Area: 8,992 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Belknap							46 034	404*
Carroll							30 428	932*
Cheshire							64 644	711*
Coos							33 352	1 805*
Grafton							68 735	1 719*
Hillsborough	299 744	876						
Merrimack					103 605	936		
Rockingham	212 199	699						
Strafford					93 819	370		
Sullivan							37 877	540*
TOTAL STATE	311 943	1 575	---	---	197 424	1 306	481 070	6 111
							(---	---)
							(481 070	6 111)*

*Less than .5 psi overpressure

STATE OF RHODE ISLAND -- DIRECT EFFECTS RISK

Estimated 1985 Population: 965,471
Land Area: 1,054 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA		LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA	
Bristol	....		46 484	26						
Kent	158 247	172								
Newport	84 236	107								
Providence	578 010	416								
Washington	98 494	333								
TOTAL STATE	918 987	1 028	46 484	26	---	---		---	---	
							(	---	---	)
							(	---	---	)*

* Less than .5 psi overpresssure

STATE OF VERMONT -- DIRECT EFFECTS RISK

Estimated 1985 Population: 534,485
Land Area: 9,272 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Addison					31 248	773		
Bennington							34 937	676*
Caledonia							26 478	651*
Chittenden	123 194	540						
Essex							6 646	666*
Franklin					36 337	649		
Grand Isle					5 002	89		
Lamoille							17 676	461*
Orange							24 019	690*
Orleans							23 993	697*
Rutland							59 226	932*
Washington							53 831	690*
Windham							38 786	786*
Windsor							53 112	972*
TOTAL STATE	123 194	540	---	---	72 587	1 511	338 704	7 221
							(---	---)
							(338 704	7 221)*

*Less than .5 psi overpressure

F E M A R E G I O N I I -- D I R E C T E F F E C T S R I S K S U M M A R Y

Estimated 1985 Population: 28,626,118
Land Area: 58,436 square miles

STATE	VERY HIGH RISK GT 10 PSI		HIGH RISK EQ/GT 5PSI LE 10PSI		MEDIUM RISK EQ/GT 2PSI LT 5PSI		LOW/NO* RISK EQ/GT .5PSI LT 2PSI	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
New Jersey	4 794 644	4 986	2 316 996	769	439 521	1 713	--- (--- (---	--- ---) ---)*
New York	14 730 822	13 655	3 427 733	3 081	559 148	7 399	2 943 560 (768 558 (175 002	23 242 8 451) 14 791)*
Puerto Rico			DATA WILL BE FURNISHED SEPARATELY					
Virgin Islands			DATA WILL BE FURNISHED SEPARATELY					
TOTAL REGION II	19 525 466	18 641	5 734 729	3 850	998 669	9 112	943 560 (768 558 (175 002	23 242 8 451) 14 791)*

*Less than .5 psi overpressure

S T A T E O F N E W J E R S E Y -- D I R E C T E F F E C T S R I S K

Estimated 1985 Population: 7,551,161
Land Area: 7,468 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Atlantic	202 977	568						
Bergen	....	....	843 976	237				
Burlington	382 675	808						
Camden	484 532	223						
Cape May	....	....	....	....	90 810	263		
Cumberland	....	....	....	....	133 582	498		
Essex	....	....	826 857	127				
Gloucester	209 076	327						
Hudson	....	....	560 606	46				
Hunterdon	....	....	....	....	93 887	427		
Mercer	315 518	227						
Middlesex	623 943	316						
Monmouth	530 780	472						
Morris	420 366	471						
Ocean	382 488	641						
Passaic	457 120	187						
Salem	66 592	338						
Somerset	212 791	305						
Sussex	....	....	....	....	121 242	525		
Union	505 786	103						
Warren	....	....	85 557	359				
STATE TOTAL	4 794 644	4 986	2 316 996	769	439 521	1 713	---	---
							(---	---)
							(---	---)*

*Less than .5 psi overpressure

STATE OF NEW YORK -- DIRECT EFFECTS RISK

Estimated 1985 Population: 17,774,143
Land Area: 47,377 square miles

	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	GT 10 PSI		EQ/GT 5PSI LT 10PSI		EQ/GT 2PSI LT 5PSI		EQ/GT .5PSI LT 2PSI	
COUNTY	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Albany	285 433	524						
Allegany							51 343	1 032*
Bronx	1 173 939	42						
Broome							213 451	712*
Cattaraugus			86 102	1 306				
Cayuga					80 381	695		
Chautauqua					146 038	1 064		
Chemung							92 406	411*
Chenango							50 447	897*
Clinton	80 924	1 043						
Columbia					61 646	638		
Cortland							47 988	500*
Delaware							46 664	1 440*
Dutchess	255 073	804						
Erie	977 687	1 046						
Essex					36 733	1 807		
Franklin							43 604	1 642*
Fulton							56 407	497
Genesee							56 691	495*
Greene							41 477	648
Hamilton							4 806	1 721
Herkimer					67 691	1 417		
Jefferson	89 068	1 273						
Kings	2 259 554	70						
Lewis							24 945	1 283

*Less than .5 psi overpressure

STATE OF NEW YORK (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Livingston							58 866	633
Madison							67 406	656
Monroe	713 316	663						
Montgomery							53 004	404
Nassau	1 342 306	287						
New York	1 463 052	22						
Niagara	217 492	526						
Oneida	253 963	1 219						
Onondaga	464 441	785						
Ontario			92 890	644				
Orange							276 972	826*
Orleans							39 425	391*
Oswego	120 383	954						
Otsego							59 978	1 004
Putnam							81 774	231*
Queens	1 916 194	108						
Rensselaer	152 266	655						
Richmond	375 223	59						
Rockland							265 505	175
St Lawrence							113 496	2 728*
Saratoga	161 216	810						
Schenectady	151 139	206						
Schoharie							30 392	624
Schuyler							17 721	329
Seneca	32 754	327						

*Less than .5 psi overpressure

STATE OF NEW YORK (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Steuben							99 365	1 396*
Suffolk	1 322 809	912						
Sullivan							67 719	976*
Tioga							50 776	519*
Tompkins							88 051	477
Ulster			163 741	1 131				
Warren	55 645	882						
Washington					56 349	836		
Wayne					88 815	603		
Westchester	866 945	438						
Wyoming							40 761	595*
Yates					21 495	339		
TOTAL STATE	14 730 822	13 655	3 427 733	3 081	559 148	7 399	943 560 (768 558 (175 002	23 242 8 451) 14 791)*

*Less than .5 psi overpressure

TERRITORY OF PUERTO RICO -- DIRECT EFFECTS RISK

Estimated 1985 Population: 3,196,520
Land Area: 3,459 square miles

COUNTY	VERY HIGH RISK GT 10 PSI		HIGH RISK EQ/GT 5PSI LT 10PSI		MEDIUM RISK EQ/GT 2PSI LT 5PSI		LOW/NO* RISK EQ/GT .5PSI LT 2PSI	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
All Counties			DATA WILL BE FURNISHED SEPARATELY					
TOTAL TERRITORY							((	))*

*Less than .5 psi overpressure

TERRITORY OF THE VIRGIN ISLANDS -- DIRECT EFFECTS RISK

Estimated 1985 Population: 104,294
Land Area: 132 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
All Counties	DATA WILL BE FURNISHED SEPARATELY							
TOTAL TERRITORY							((	))*

*Less than .5 psi overpressure

FEMA REGION III -- DIRECT EFFECTS RISK SUMMARY

Estimated 1985 Population: 25,107,876
Land Area: 120,550 square miles

STATE	VERY HIGH RISK GT 10 PSI		HIGH RISK EQ/GT 5PSI LT 10PSI		MEDIUM RISK EQ/GT 2PSI LT 5PSI		LOW/NO* RISK EQ/GT .5PSI LT 2PSI	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Delaware	425 022	991	---	---	---	---	105 207	942
							(---	000)
							(105 207	942)*
Dist. of Columbia	618 906	63	---	---	---	---	---	---
							(---	---)
							(---	---)*
Maryland	3 863 638	5 462	246 820	703	46 396	871	224 889	2 802
							(105 974	1 609)
							118 915	1 193)*
Pennsylvania	9 115 680	20 270	338 141	1 033	1 186 856	6 535	1 268 406	17 054
							(960 670	10 882)
							(297 736	6 172)*
Virginia	3 482 624	8 573	201 907	3 847	379 967	3 964	1 650 843	23 316
							(882 245	12 762)
							(768 598	10 554)*
West Virginia	1 100 851	7 937	38 605	533	159 255	2 151	653 545	13 503
							(412 604	6 140)
							(240 941	7 363)*
TOTAL REGION	18 606 721	43 296	825 473	6 116	1 790 474	13 521	3 838 890	57 614
							(2 307 493	31 393)
							(1 531 397	26 224)*

*Less than .5 psi overpressure

STATE OF DELAWARE -- DIRECT EFFECTS RISK

Estimated 1985 Population: 530,229
Land Area: 1,933 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Kent	15 037	595						
New Castle	409 985	396						
Sussex	....						105 207	942*
TOTAL STATE	425 022	991	---	---	---	---	105 207	942
							(---	---)
							(105 207	942)*

*Less than .5 psi overpressure

DISTRICT OF COLUMBIA -- DIRECT EFFECTS RISK

Estimated 1985 Population: 618,906
Land Area: 63 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 5PSI LT 2PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Dist. of Columbia	618 906	63						
TOTAL DISTRICT	618 906	63	---	---	---	---	--- (--- (---	--- ---) ---)*

*Less than .5 psi overpressure

STATE OF MARYLAND -- DIRECT EFFECTS RISK

Estimated 1985 Population: 4,381,743
Land Area: 9,838 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Allegany	76 002	421						
Anne Arundel	393 425	419						
Baltimore	677 372	598						
Calvert	40 418	213						
Caroline							23 715	321
Carroll			106 853	452				
Cecil	66 776	359						
Charles	84 030	452						
Dorchester					29 717	593		
Frederick	126 295	663						
Garrett							26 913	657
Harford	152 156	447						
Howard			139 967	251				
Kent					16 679	278		
Montgomery	635 241	495						
Prince Georges	678 149	487						
Queen Annes							28 229	372
St Marys	64 355	373						
Somerset							18 515	339*
Talbot							27 117	259
Washington	111 651	455						
Wicomico							66 361	379*
Worcester							34 039	475*
Baltimore City	757 768	80						
TOTAL STATE	3 863 638	5 462	246 820	703	46 396	871	224 889	2 802
							(105 974	1 609)
							(118 915	1 193)*

* Less than .5 psi overpressure

S T A T E O F P E N N S Y L V A N I A -- D I R E C T E F F E C T S R I S K

Estimated 1985 Population: 11,909,083
Land Area: 44,892 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Adams	68 459	521						
Allegheny	1 399 652	727						
Armstrong	83 324	646						
Beaver	197 808	436						
Bedford							48 356	1 017
Berks	318 305	861						
Blair							133 813	527
Bradford							64 199	1 152*
Bucks	515 874	610						
Butler	152 040	789						
Cambria							175 533	691
Cameron							6 596	398*
Carbon	54 170	385						
Centre	114 856	1 106						
Chester	339 008	758						
Clarion	42 996	607						
Clearfield							84 733	1 149
Clinton							39 156	892
Columbia	61 778	486						
Crawford							89 061	1 011*
Cumberland	186 988	547						
Dauphin	236 650	528						
Delaware	550 418	184						
Elk							37 425	830*
Erie	282 674	804						

* Less than .5 psi overpressure

STATE OF PENNSYLVANIA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Fayette	159 070	794						
Forest							5 018	428*
Franklin	116 866	774						
Fulton							13 721	437
Greene	41 362	577						
Huntingdon							42 811	877
Indiana	93 550	829						
Jefferson	49 051	656						
Juniata							19 980	392*
Lackawanna	222 969	461						
Lancaster	386 020	952						
Lawrence					105 403	363		
Lebanon							111 919	363
Lehigh	277 519	348						
Luzerne					334 652	891		
Lycoming	116 783	1 237						
McKean	48 882	979						
Mercer					126 574	672		
Mifflin							46 580	413
Monroe					79 149	609		
Montgomery	662 853	486						
Montour							17 066	131
Northampton	232 130	376						
Northumberland							100 144	461
Perry					38 081	557		
Philadelphia	1 636 321	136						
Pike							21 143	551*
Potter							18 490	1 081*
Schuylkill					158 879	781		
Snyder							35 824	329*

*Less than .5 psi overpressure

STATE OF PENNSYLVANIA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Somerset					82 007	1 073		
Sullivan							6 159	451
Susquehanna							39 233	826
Tioga							40 093	1 131
Union							33 796	317
Venango	64 445	679						
Warren	47 707	885						
Washington					217 162	858		
Wayne					38 414	731		
Westmoreland			385 141	1 033				
Wyoming							27 557	399
York	324 687	906						
TOTAL STATE	9 115 680	20 270	338 141	1 033	1 186 856	6 535	1 268 406	17 054
							(960 670	10 882)
							(297 736	6 172)*

*Less than .5 psi overpressure

STATE OF VIRGINIA -- DIRECT EFFECTS RISK

Estimated 1985 Population: 5,715,659
Land Area: 39,700 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Accomack					30 877	476		
Albemarle							59 605	725
Alleghany							13 541	446
Amelia							8 247	357
Amherst			29 207	478				
Appomattox							12 380	336
Arlington	154 597	26						
Augusta	54 869	989						
Bath							5 302	537*
Bedford			37 379	747				
Bland							6 584	359
Botetourt	23 987	545						
Brunswick							16 369	563
Buchanan							37 878	504*
Buckingham							11 972	583*
Campbell			46 194	505				
Caroline	18 878	536						
Carroll							28 517	478
Charles City			6 751	181				
Charlotte							11 840	476*
Chesterfield	164 500	434						
Clarke	10 212	178						
Craig							4 029	330
Culpeper							23 367	382
Cumberland							7 883	300*

*Less than .5 psi overpressure

STATE OF VIRGINIA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LO/NO* RISK POPULATION	LO/NO* RISK AREA
Dickenson							20 223	331*
Dinwiddie					21 091	507		
Essex							8 754	263*
Fairfax	692 187	393						
Fauquier	40 110	651						
Floyd					11 749	381		
Fluvanna							10 519	290*
Franklin							37 107	683
Frederick							35 630	415
Giles					17 799	362		
Gloucester							25 841	225
Goochland							12 676	281
Grayson							16 832	446*
Greene							8 522	157*
Greensville							10 082	300*
Halifax			29 663	816				
Hanover					52 693	468		
Henrico	195 226	238						
Henry							56 311	382*
Highland							2 797	416*
Isle of Wight			25 553	319				
James City	25 364	153						
King & Queen							5 897	317*
King George							11 204	180
King William							9 888	278
Lancaster							10 760	133*
Lee							27 010	437*
Loudoun	63 985	521						
Louisa	19 918	497						
Lunenburg					12 155	432		

*Less than .5 psi overpressure

STATE OF VIRGINIA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Madison							10 609	322*
Mathews							8 623	87
Mecklenburg							27 798	616*
Middlesex							8 286	134*
Montgomery	65 379	390						
Nelson					12 336	475		
New Kent							10 111	213
Northhampton					14 097	226		
Northumberland							9 918	185*
Nottoway	14 182	317						
Orange							19 053	342
Page							19 593	313*
Patrick							17 739	481
Pittsylvania							66 604	995
Powhatan							13 752	261
Prince Edward							16 928	354
Prince George	26 007	266						
Prince William	169 165	339						
Pulaski	34 978	318						
Rappahannock							6 117	267
Richmond							6 816	193*
Roanoke							74 101	251
Rockbridge							18 123	603
Rockingham							53 179	865
Russell							33 140	479
Scott					25 669	536		
Shenandoah							28 403	512*
Smyth							33 437	452*
Southampton							19 089	603*
Spotsylvania	36 716	404						

*Less than .5 psi overpressure

STATE OF VIRGINIA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Stafford			48 799	271				
Surry	6 288	281						
Sussex							10 226	492
Tazewell			51 785	520				
Warren							22 363	217*
Washington							47 631	563*
Westmoreland							14 279	227
Wise							45 748	405*
Wythe							25 624	464*
York	40 171	113						

INDEPENDENT CITIES

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Alexandria	107 977	15						
Bedford							6 277	7
Bristol							18 401	12*
Buena Vista							6 414	3*
Charlottesville							40 757	10*
Chesapeake	128 906	340						
Clifton Forge							4 803	3*
Colonial Heights			17 613	8				
Covington							7 492	4*
Danville							44 426	17*
Emporia							4 822	2*
Fairfax					20 471	6		
Falls Church			9 547	2				
Franklin							7 175	4*
Fredericksburg							19 356	6
Galax							6 507	8*
Hampton	126 828	51						
Harrisonburg							26 543	6*
Hopewell	24 495	10						
Lexington							6 774	2*

*Less than .5 psi overpressure

STATE OF VIRGINIA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Lynchburg	67 430	49						
Manassas							25 643	8
Manassas Park							6 524	2*
Martinsville							18 264	11*
Newport News	159 965	65						
Norfolk	282 850	53						
Norton							4 446	7*
Petersburg	40 714	23						
Poquoson	10 073	17						
Portsmouth	108 802	30						
Radford	13 415	7						
Richmond	219 010	60						
Roanoke					100 799	43		
Salem							24 293	14
South Boston							7 353	5*
Staunton							21 871	8
Suffolk					49 070	409		
Virginia Beach	320 264	256						
Waynesboro	15 194	8						
Williamsburg					11 161	5		
Winchester							20 561	9
TOTAL STATE	3 482 624	8 573	201 907	3 847	379 967	3 964	1 650 843	23 316
							(882 245	12 762)
							(768 598	10 554)*

*Less than .5 psi overpressure

STATE OF WEST VIRGINIA -- DIRECT EFFECTS RISK

Estimated 1985 Population: 1,952,256
Land Area: 24,124 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Barbour					16 575	343		
Berkeley	50 737	322						
Boone							30 926	503
Braxton							14 867	513*
Brooke	29 855	90						
Cabell	105 480	282						
Calhoun							8 754	280*
Clay					11 636	346		
Dodridge							7 728	321
Fayette							56 777	667
Gilmer							8 570	340*
Grant	10 700	480						
Greenbrier	36 418	1 025						
Hampshire							16 044	644*
Hancock	39 360	85						
Hardy							10 750	585*
Harrison	77 827	417						
Jackson							26 271	464
Jefferson	32 646	209						
Kanawha	225 530	901						
Lewis							18 828	389
Lincoln	23 898	439						
Logan							51 109	456*
McDowell	46 772	535						
Marion	64 570	312						

* Less than .5 psi overpressure

STATE OF WEST VIRGINIA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Marshall	40 688	305						
Mason	26 520	433						
Mercer	74 229	420						
Mineral	27 657	329						
Mingo							38 728	424*
Monongalia							78 079	363
Monroe							13 156	473
Morgan							11 225	230
Nicholas							27 964	650*
Ohio					60 308	106		
Pendleton							7 970	698*
Pleasants	7 959	131						
Pocahontas							9 687	942*
Preston							31 346	651
Putnam	40 735	346						
Raleigh							86 190	608
Randolph							29 608	1 040*
Ritchie							11 700	454
Roane					15 630	484		
Summers							15 424	353
Taylor			16 499	174				
Tucker					8 759	421		
Tyler					11 013	258		
Upshur							24 904	355
Wayne	46 385	508						

*Less than .5 psi overpressure

STATE OF WEST VIRGINIA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Webster							11 609	556*
Wetzel			22 106	359				
Wirt							5 281	235*
Wood	92 885	368						
Wyoming					35 334	502		
TOTAL STATE	1 100 851	7 937	38 605	533	159 255	2 151	653 545	13 503
							(412 604	6 140)
							(240 941	7 363)*

* Less than .5 psi overpressure

F E M A R E G I O N I V -- D I R E C T E F F E C T S R I S K S U M M A R Y

Estimated 1985 Population: 42,442,705
Land Area: 379,046 square miles

	VERY HIGH RISK GT 10 PSI		HIGH RISK EQ/GT 5PSI LT 10PSI		MEDIUM RISK EQ/GT 2PSI LT 5PSI		LOW/NO* RISK EQ/GT .5PSI LT 2PSI	
STATE	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Alabama	2 097 642	11 466	47 012	622	293 160	4 514	1 521 331	34 137
							(838 407	16 789)
							(682 924	17 348)*
Florida	8 793 081	22 226	---	---	302 800	3 132	2 787 465	38 039
							(1 449 745	21 841)
							(1 337 720	16 198)*
Georgia	3 233 308	9 311	371 511	4 297	395 251	4 824	1 929 163	39 685
							(859 567	16 431)
							(1 069 596	23 254)*
Kentucky	1 555 778	7 020	106 002	936	312 507	2 083	1 755 859	29 550
							(601 871	11 122)
							(1 153 988	18 428)*
Mississippi	1 034 591	8 037	39 226	1 093	149 393	3 214	1 393 923	34 830
							(278 077	7 863)
							(1 115 846	26 967)*
North Carolina	2 342 278	10 017	---	---	809 177	4 625	3 082 319	34 201
							(1 133 455	10 002)
							(1 948 864	24 001)*
South Carolina	1 384 092	8 113	199 592	2 058	32 178	1 145	1 727 560	18 891
							(1 079 509	10 118)
							(648 051	8 773)*
Tennessee	2 459 809	6 849	213 131	2 717	108 999	1 934	1 874 577	29 430
							(888 913	11 507)
							(985 664	17 923)*
TOTAL REGION IV	22 990 579	83 039	976 474	11 723	2 403 465	25 471	16 072 187	258 813
							(6 109 444	105 673)
							(9 962 743	153 140)

*Less than .5 psi overpressure

STATE OF ALABAMA -- DIRECT EFFECTS RISK

Estimated 1985 Population: 3,959,145
Land Area: 50,739 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Autauga							33 760	597
Baldwin					88 981	1 590		
Barbour							25 494	884*
Bibb							16 836	625
Blount							37 155	643
Bullock							10 624	625*
Butler							22 263	779*
Calhoun	127 200	611						
Chambers							40 557	596
Cherokee							19 540	553*
Chilton							31 425	695*
Choctaw							16 995	909*
Clark					28 781	1 203		
Clay							13 582	605
Cleburne							12 925	561
Coffee	40 578	680						
Colbert							53 878	589*
Conecuh							15 464	854*
Coosa							11 336	657
Covington							37 040	1 038
Crenshaw							13 832	611*
Cullman							64 229	738
Dale	45 314	561						
Dallas							55 090	975*
De Kalb							55 080	778

*Less than .5 psi overpressure

STATE OF ALABAMA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK		
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION		AREA
Elmore			47 012	622					
Escambia							37 656	x	951
Etowah							103 697	x	542
Fayette							19 147	x	630
Franklin							28 748		643*
Geneva							23 783		578
Greene							11 243		631
Hale							15 065		661*
Henry							15 326		557
Houston	79 172	577							
Jackson	51 402	1 069							
Jefferson	671 808	1 119							
Lamar							16 420		605
Lauderdale							81 917		661*
Lawrence							31 671		693*
Lee					79 209	609			
Limestone					47 639	559			
Lowndes							13 093		714
Macon							25 901		614*
Madison	213 250	806							
Marengo							24 957		982*
Marion							31 414		743*
Marshall							69 502		567*
Mobile	328 158	1 238							
Monroe							22 468		1 019*

*Less than .5 psi overpressure

STATE OF ALABAMA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Montgomery	206 993	793						
Morgan	94 796	575						
Perry							15 045	719*
Pickens							21 915	890
Pike							28 106	672
Randolph							20 236	585
Russell					48 550	634		
St Clair							44 539	646
Shelby	75 418	800						
Sumter							17 202	907*
Talladega	77 228	753						
Tallapoosa							39 107	701*
Tuscaloosa							139 201	1 336
Walker	68 882	803						
Washington	17 443	1 081						
Wilcox							15 322	883*
Winston							21 545	614
TOTAL STATE	2 097 642	11 466	47 012	622	293 160	4 514	1 521 331	34 137
							(838 407	16 789)
							(682 924	17 348)*

*Less than .5 psi overpressure

STATE OF FLORIDA -- DIRECT EFFECTS RISK

Estimated 1985 Population: 11,883,346
Land Area: 63,397 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	VERY HIGH RISK GT 10 PSI AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	HIGH RISK EQ/GT 5PSI LT 10PSI AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	MEDIUM RISK EQ/GT 2PSI LT 5PSI AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	LOW/NO* RISK EQ/GT .5PSI LT 2PSI AREA
Alachua							789 260	902*
Baker							17 591	585*
Bay					111 180	758		
Bradford							23 983	293
Brevard	343 585	995						
Broward	1 112 075	1 211						
Calhoun							9 556	568*
Charlotte	79 404	690						
Citrus	78 546	629						
Clay	84 793	592						
Collier							116 981	1 994*
Columbia							39 947	797*
Dade	1 726 021	1 995						
De Soto							21 295	636
Dixie							9 476	701*
Duval	623 035	776						
Escambia	260 730	661						
Flagler							16 816	491
Franklin							8 343	545
Gadsen							43 693	518
Gilchrist							7 267	354*
Glades							6 765	763*
Gulf							11 349	559
Hamilton							9 342	517*
Hardee							20 818	637*

*Less than .5 psi overpressure

STATE OF FLORIDA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Hendry							22 565	1 163*
Hernando							74 901	477*
Highlands							58 524	1 029*
Hillsborough	743 771	1 053						
Holmes							15 934	488*
Indian River							77 629	497
Jackson							40 768	942*
Jefferson							11 658	609
Lafayette							4 332	545*
Lake					127 239	954		
Lee							246 738	803
Leon	168 231	676						
Levy	24 623	1 100						
Liberty							4 576	837*
Madison							15 443	710
Manatee	174 772	947						
Marion							163 799	1 610
Martin	82 856	555						
Monroe	71 003	1 034						
Nassau					38 569	649		
Okaloosa	131 901	936						
Okeechobee					25 812	771		
Orange	547 930	910						
Osceola							74 576	1 350
Palm Beach	721 030	1 993						
Pasco							232 936	738
Pinellas	808 500	280						
Polk							363 740	1 823
Putnam							59 098	733
St Johns							67 087	617

*Less than .5 psi overpressure

STATE OF FLORIDA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
St Lucie	117 109	581						
Santa Rosa	65 097	1 024						
Sarasota	246 395	573						
Seminole	232 587	298						
Sumter							29 162	561*
Suwannee							25 644	690*
Taylor							18 167	1 058*
Union							11 562	246
Volusia	310 689	1 113						
Wakulla	12 889	601						
Walton	25 509	1 066						
Washington							16 144	590*
TOTAL STATE	8 793 081	22 226	---	---	302 800	3 132	2 787 465 (1 449 745 (1 337 720	38 039 21 841) 16 198)*

*Less than .5 psi overpressure

STATE OF GEORGIA -- DIRECT EFFECTS RISK

Estimated 1985 Population: 5,929,233
Land Area: 58,117 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Appling	16 441	510						
Atkinson							6 254	344*
Bacon							9 572	286*
Baker							3 541	347*
Baldwin							38 659	258*
Banks							9 940	234*
Barrow							24 768	163
Bartow	44 059	456						
Ben Hill							17 067	254*
Berrien							13 842	456
Bibb	158 476	253						
Bleckley							10 645	219
Brantley							9 430	444
Brooks							15 299	491
Bryan							12 164	441
Bulloch							37 271	678*
Burke			20 728	833				
Butts							15 169	187
Calhoun							5 527	284*
Camden	17 682	649						
Candler							7 833	248*
Carroll	63 098	502						
Catoosa					38 746	163		
Charlton							7 741	780
Chatham	214 908	444						

*Less than .5 psi overpressure

STATE OF GEORGIA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Chattahoochee							20 139	250
Chattooga							21 345	314*
Cherokee							65 533	424
Clarke	76 890	122						
Clay							3 278	197*
Clayton	165 686	148						
Clinch							6 863	821*
Cobb	368 393	343						
Coffee							28 818	602*
Colquitt							36 484	556*
Columbia					51 795	290		
Cook							13 889	232
Coweta					43 886	444		
Crawford							7 087	328
Crisp							20 258	275*
Dade							11 389	176
Dawson							5 873	210*
Decatur							26 635	586*
De Kalb	506 550	270						
Dodge							16 747	504*
Dooly							10 616	397*
Dougherty	103 630	330						
Douglas	65 631	203						
Early			13 150	516				
Echols							2 235	420
Effingham							21 091	482
Elbert							19 042	367*
Emanuel							21 366	688*
Evans							8 504	186*
Fannin	15 266	384						

*Less than .5 psi overpressure

STATE OF GEORGIA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Fayette					42 806	199		
Floyd							78 516	519
Forsyth							34 431	226
Franklin							15 569	264*
Fulton	621 030	534						
Gilmer							11 822	427
Glascock							2 331	144*
Glynn	60 350	412						
Gordon							32 616	355*
Grady							21 318	459
Greene							11 978	390*
Gwinnett			246 112	435				
Habersham							27 014	278*
Hall							83 207	379*
Hancock							9 302	469*
Haralson							19 589	283
Harris			16 380	464				
Hart							19 220	230*
Heard			6 750	292				
Henry							43 673	321
Houston	85 180	380						
Irwin							8 813	362*
Jackson			27 158	342				
Jasper					7 744	371		
Jeff Davis							11 846	335*
Jefferson							18 725	529*
Jenkins							8 421	353
Johnson							8 602	307
Jones	18 579	394						
Lamar							12 294	186*
Lanier							5 644	194*

*Less than .5 psi overpressure

STATE OF GEORGIA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Laurens							38 253	816*
Lee					14 081	358		
Liberty	41 837	517						
Lincoln							6 892	196*
Long					5 675	402		
Lowndes	72 742	507						
Lumpkin							12 036	287*
McDuffie							19 633	256
McIntosh			8 025	425				
Macon							14 188	404*
Madison	19 508	285						
Marion							5 384	366*
Meriwether							20 661	506*
Miller							6 795	284*
Mitchell					21 841	512		
Monroe			14 949	397				
Montgomery							6 934	244
Morgan							12 230	349
Murray							21 438	345
Muscogee	177 080	218						
Newton					38 957	277		
Oconee					14 648	186		
Oglethorpe							9 543	442
Paulding	29 957	312						
Peach							19 200	151
Pickens							13 303	232*
Pierce							12 730	344*
Pike							8 631	219*
Polk	33 165	312						
Pulaski							8 959	249*

*Less than .5 psi overpressure

STATE OF GEORGIA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Putnam							11 700	344*
Quitman							2 156	146*
Rabun							10 840	370*
Randolph							9 381	481*
Richmond	189 036	326						
Rockdale	44 501	132						
Schley							3 354	169*
Screven							14 396	655*
Seminole							8 775	225
Spalding							51 453	199*
Stephens							22 239	177*
Stewart							5 862	452*
Sumter							30 374	488*
Talbot							6 496	395*
Taliaferro							1 986	196*
Tattnall					17 783	484		
Taylor							8 082	382*
Telfair							11 042	444*
Terrell							11 943	337
Thomas							38 187	551
Tift							33 722	268
Toombs	23 633	371						
Towns							6 279	165*
Treutlen							5 997	202*
Troup							53 248	415*
Turner							9 643	289*
Twiggs					9 744	362		
Union							10 583	320*
Upson							26 591	326*
Walker					55 155	446		

*Less than .5 psi overpressure

STATE OF GEORGIA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Walton					32 390	330		
Ware							37 123	907
Warren							6 439	286
Washington							19 307	683
Wayne							22 128	647
Webster							2 077	210
Wheeler							5 056	299
White							11 205	242
Whitfield							68 141	291
Wilcox							7 559	382
Wilkes							11 356	470
Wilkinson							10 778	458
Worth			18 259	575				
TOTAL STATE	3 233 308	9 311	371 511	4 297	395 251	4 824	1 929 163	39 685
							(859 567	16 431)
							(1 069 596	23 254)*

*Less than .5 psi overpressure

STATE OF KENTUCKY -- DIRECT EFFECTS RISK

Estimated 1985 Population: 3,730,146
Land Area: 39,639 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Adair							15 857	407*
Allen							14 370	338*
Anderson							13 522	204
Ballard			8 186	254				
Barren							34 692	482*
Bath							10 263	278*
Bell							34 201	361*
Boone					51 553	246		
Bourbon							19 147	292
Boyd	54 575	161						
Boyle							25 106	182*
Bracken							7 555	203*
Breathitt							16 453	495*
Breckinridge							16 566	565
Bullitt					45 100	300		
Butler			11 958	431				
Caldwell							13 265	347*
Calloway							30 551	386*
Campbell			80 896	152				
Carlisle							5 262	191
Carroll	9 850	130						
Carter							25 814	407
Casey							15 293	445
Christian	64 360	722						
Clark							29 442	255*

*Less than .5 psi overpressure

STATE OF KENTUCKY (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW/NO* RISK POPULATION	AREA
Clay							23 867	471*
Clinton							9 984	196*
Crittenden							8 896	360*
Cumberland							7 334	304*
Daviess							88 834	463*
Edmonson							11 567	302*
Elliott							6 923	234*
Estill							15 107	256
Fayette	211 628	285						
Fleming							12 524	351
Floyd	51 295	393						
Franklin	44 192	212						
Fulton							8 234	211*
Gallatin			4 962	99				
Garrard					11 397	232		
Grant							14 477	259*
Graves							37 712	557
Grayson							22 631	493*
Green							10 950	289*
Greenup							38 515	347
Hancock							8 242	189*
Hardin	90 545	629						
Harlan							42 139	468*
Harrison							15 678	310
Hart							17 009	412*
Henderson							42 474	438
Henry							13 467	291
Hickman							5 618	245*
Hopkins							46 424	552*
Jackson					12 586	346		

*Less than .5 psi overpressure

STATE OF KENTUCKY (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Jefferson	682 179	386						
Jessamine							28 497	175
Johnson							25 895	264
Kenton					136 391	163		
Knott							18 395	352
Knox							30 205	358*
Larue							12 018	263*
Laurel							42 251	434*
Lawrence							15 007	420
Lee							7 781	211*
Leslie							15 407	402*
Letcher							30 977	339*
Lewis	14 458	484						
Lincoln							19 180	332
Livingston							9 131	312*
Logan							26 045	556
Lyon							6 425	209*
McCracken	61 367	251						
McCreary							16 306	427
McLean							9 948	256
Madison	55 644	443						
Magoffin							14 251	310
Marion							17 699	347*
Marshall							25 976	304*
Martin							1 063	231
Mason							17 091	241
Meade	22 789	307						
Menifee							5 353	203*
Mercer							19 405	250*
Metcalfe							10 359	291*

*Less than .5 psi overpressure

STATE OF KENTUCKY (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Monroe							12 618	331*
Montgomery							20 410	199*
Morgan							12 122	382*
Muhlenberg	31 696	478						
Nelson							28 923	424*
Nicholas							7 330	197*
Ohio	21 875	596						
Oldham							30 519	190
Owen							9 217	354
Owsley							5 641	198*
Pendleton							10 767	281*
Perry							35 419	341*
Pike	83 875	785						
Powell							11 907	180
Pulaski	49 129	660						
Robertson							2 383	100*
Rockcastle					14 664	318		
Rowan							19 043	282*
Russell							15 141	250
Scott					21 971	286		
Shelby							24 243	385
Simpson							14 936	236*
Spencer							6 148	192*
Taylor							22 162	270*
Todd							10 649	377
Trigg							9 386	421
Trimble	6 321	148						
Union							17 807	341*
Warren							82 907	547*
Washington							10 291	301

*Less than .5 psi overpressure

STATE OF KENTUCKY (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Wayne							17 759	446
Webster							14 730	336*
Whitley							35 619	443*
Wolfe							7 152	223*
Woodford					18 845	192		
TOTAL STATE	1 555 778	7 070	106 002	936	312 507	2 083	1 755 859 (601 871 (1 153 988	29 550 11 122) 18 428)*

*Less than .5 psi overpressure

STATE OF MISSISSIPPI -- DIRECT EFFECTS RISK

Estimated 1985 Population: 2,617,133
Land Area: 47,174 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Adams							39 119	456*
Alcorn							32 183	401*
Amite							13 288	732*
Attala							18 901	737*
Benton							8 126	407*
Bolivar							45 246	892*
Calhoun							15 196	573*
Carroll							9 173	634*
Chickasaw							17 923	503*
Choctaw							8 542	420*
Claiborne							12 621	494*
Clarke							16 823	692
Clay			22 053	415				
Coahoma							35 424	559*
Copiah							25 744	779*
Covington							15 888	416*
De Soto					58 091	483		
Forrest	70 812	469						
Franklin							8 373	566*
George					16 044	483		
Greene					9 382	718		
Grenada							21 543	421*
Hancock	29 671	478						
Harrison	171 484	581						
Hinds	261 467	875						

*Less than .5 psi overpressure

STATE OF MISSISSIPPI (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Holmes							23 784	759
Humphreys							13 934	430
Issaquena							2 147	406*
Itawamba							20 299	541*
Jackson	124 917	731						
Jasper			17 173	678				
Jefferson							9 793	523*
Jefferson Davis							14 104	409*
Jones	64 507	695						
Kemper							10 373	766
LaFayette							32 522	609*
Lamar	26 768	499						
Lauderdale	80 005	705						
Lawrence							13 144	435*
Leake							18 683	584*
Lee							61 285	451*
LeFlore							42 369	605*
Lincoln							31 099	586*
Lowndes	61 314	517						
Madison					45 724	717		
Marion							27 571	548
Marshall							32 405	709
Monroe	36 628	772						
Montgomery							12 660	408*
Neshoba							24 674	571
Newton							20 288	580
Noxubee							12 537	698*
Oktibbeha							38 129	459
Panola							29 785	695*
Pearl River							38 167	819

*Less than .5 psi overpressure

STATE OF MISSISSIPPI (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Perry							10 646	651*
Pike							36 699	410*
Pontotoc							21 744	499*
Prentiss							24 682	417*
Quitman							11 334	406*
Rankin	80 192	782						
Scott							25 256	610*
Sharkey							8 076	435
Simpson							24 762	591*
Smith							14 554	635
Stone							10 110	446*
Sunflower							37 634	707*
Tallahatchie							16 124	651*
Tate							21 311	406*
Tippah							18 985	458*
Tishomingo							17 338	434*
Tunica							9 299	460
Union							21 595	417*
Walthall							12 870	404*
Warren							51 872	597*
Washington							72 533	733*
Wayne					20 152	813		
Webster							10 196	424*
Wilkinson							10 484	678*
Winston							18 567	610*
Yalobusha							13 387	478*
Yazoo	26 826	933						
TOTAL STATE	1 034 591	8 037	39 226	1 093	149 393	3 214	1 393 923	34 830
							(278 077	7 863
							(1 115 846	26 967)*

*Less than .5 psi overpressure

STATE OF NORTH CAROLINA -- DIRECT EFFECTS RISK

Estimated 1985 Population: 6,233,774
Land Area: 48,843 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Alamance	102 865	433						
Alexander							26 671	259*
Alleghany							9 941	234*
Anson							26 266	533*
Ashe							23 263	426*
Avery							15 040	247*
Beaufort							43 217	826*
Bertie							21 491	701*
Bladen					30 794	879		
Brunswick	45 643	861						
Buncombe							166 717	659*
Burke							75 193	505*
Cabarrus							93 522	364
Caldwell							68 745	471*
Camden							5 866	241*
Carteret	48 181	525						
Caswell					22 441	427		
Catawba	112 583	396						
Chatham							35 680	708*
Cherokee					20 231	452		
Chowan							12 995	181*
Clay							7 093	214*
Cleveland							84 762	468*
Columbus							51 937	939*
Craven							77 821	702

*Less than .5 psi overpressure

STATE OF NORTH CAROLINA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Cumberland	252 353	657						
Currituck							13 318	256
Dare							17 107	391*
Davidson					118 693	548		
Davie							27 416	267
Duplin							41 650	819
Durham							160 837	298
Edgecombe							58 790	506*
Forsyth	258 622	412						
Franklin							32 305	494*
Gaston					170 614	357		
Gates							9 357	338*
Graham							7 104	289*
Granville							36 884	534*
Greene							16 464	266
Guilford					327 323	651		
Halifax							56 258	724*
Harnett					62 366	601		
Haywood							47 835	555*
Henderson							66 501	375*
Hertford							24 076	356*
Hoke					22 566	391		
Hyde							5 925	624*
Iredell	87 260	574						
Jackson							27 318	490*
Johnston							76 426	795
Jones							9 806	470
Lee							40 039	259
Lenoir							61 276	402
Lincoln	45 086	298						

*Less than .5 psi overpressure

STATE OF NORTH CAROLINA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
McDowell							36 454	437*
Macon							23 466	517*
Madison							17 250	451*
Martin							27 437	461*
Mecklenburg	439 986	528						
Mitchell							14 258	222*
Montgomery							23 665	490
Moore	55 254	701						
Nash							70 931	540*
New Hanover	112 147	185						
Northampton							22 485	538*
Onslow	120 039	763						
Orange							81 875	400*
Pamlico							10 925	341*
Pasquotank							29 502	228*
Pender							24 268	875
Perquimans							9 913	246*
Person	30 316	398						
Pitt							96 024	656*
Polk							14 758	238*
Randolph							97 642	789
Richmond	45 644	477						
Robeson	106 472	949						
Rockingham							85 801	569
Rowan							102 667	519*
Rutherford							56 501	568*
Sampson							50 707	947
Scotland					34 149	319		
Stanly							50 203	396*
Stokes	35 319	452						

*Less than .5 psi overpressure

STATE OF NORTH CAROLINA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Surry							60 500	539
Swain							10 818	526*
Transylvania							25 249	378*
Tyrrell							4 130	407*
Union							77 802	639
Vance							38 320	249*
Wake	346 147	854						
Warren							16 236	427*
Washington							14 473	332*
Watauga							34 273	314*
Wayne	98 361	554						
Wilkes							60 948	752*
Wilson							64 997	374
Yadkin							29 498	336
Yancey							15 431	314*
TOTAL STATE	2 342 278	10 017	---	---	809 177	4 625	3 082 319 (1 133 455 (1 948 864	34 201 10 002) 24 001)*

*Less than .5 psi overpressure

STATE OF SOUTH CAROLINA -- DIRECT EFFECTS RISK

Estimated 1985 Population: 3,343,422
Land Area: 30,207 square miles

	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	GT 10 PSI		EQ/GT 5PSI LT 10PSI		EQ/GT 2PSI LT 5PSI		EQ/GT .5PSI LT 2PSI	
COUNTY	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Abbeville							22 919	508*
Aiken	113 409	1 092						
Allendale			10 904	413				
Anderson							139 797	718
Bamberg							18 097	395*
Barnwell			20 308	558				
Beaufort	81 853	579						
Berkeley	117 319	1 108						
Calhoun			11 431	380				
Charleston	291 814	938						
Cherokee							41 186	396
Chester							30 992	580*
Chesterfield							38 454	802*
Clarendon							28 112	602
Colleton							33 866	1 052
Darlington							64 933	563*
Dillon							32 316	406*
Dorchester							73 846	575
Edgefield					17 809	490		
Fairfield							20 805	685
Florence							114 936	804*
Georgetown	47 533	822						
Greenville							303 866	795
Greenwood							60 352	451*
Hampton							18 899	561

*Less than .5 psi overpressure

STATE OF SOUTH CAROLINA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Horry	126 279	1 143						
Jasper					14 369	655		
Kershaw							42 124	723
Lancaster							55 843	552*
Laurens							53 481	712*
Lee							18 510	411
Lexington			156 949	707				
McCormick							7 183	350
Marion							34 924	493*
Marlboro							32 459	483*
Newberry							32 044	634*
Oconee	51 780	629						
Orangeburg							86 706	1 112
Pickens	85 403	499						
Richland	282 019	762						
Saluda							17 017	456*
Spartanburg	209 163	814						
Sumter	94 839	665						
Union							30 826	515
Williamsburg							39 284	934*
York							116 464	685
TOTAL STATE	1 384 092	8 113	199 592	2 058	32 178	1 145	1 727 560 (1 079 509 (648 051	18 891) 10 118) 8 773)*

*Less than .5 psi overpressure

STATE OF TENNESSEE -- DIRECT EFFECTS RISK

Estimated 1985 Population: 4,746,516
Land Area: 40,930 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Anderson	69 607	339						
Bedford					28 701	475		
Benton							15 088	392*
Bledsoe							9 278	407*
Blount							81 926	558
Bradley	70 601	327						
Campbell							35 490	479*
Cannon							10 725	266*
Carroll			28 302	600				
Carter							51 658	341*
Cheatham							23 557	303
Chester							12 837	289*
Claiborne							26 644	432*
Clay							8 061	227*
Cocke							29 318	432*
Coffee	40 569	429						
Crockett							13 895	266
Cumberland							31 190	682
Davidson	487 241	501						
Decatur							10 958	330*
DeKalb							13 881	291*
Dickson							31 624	491
Dyer							33 920	520
Fayette							24 623	705*
Fentress							15 603	498*

*Less than .5 psi overpressure

STATE OF TENNESSEE (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Franklin	33 382	543						
Gibson	48 338	602						
Giles							24 789	610*
Grainger							17 155	273*
Greene			56 054	619				
Grundy							14 085	361*
Hamblen							59 098	156*
Hamilton	282 988	539						
Hancock							6 751	480
Hardeman							23 322	670*
Hardin							22 314	578*
Hawkins			45 137	486				
Haywood							20 547	534*
Henderson							21 854	520
Henry							29 023	560*
Hickman							15 927	610*
Houston	7 011	200						
Humphreys							15 702	527
Jackson							9 146	308*
Jefferson							35 027	266*
Johnson							14 302	297*
Knox	331 840	506						
Lake							8 310	168*
Lauderdale							24 256	475
Lawrence							34 625	617*
Lewis							10 580	282*
Lincoln							26 229	571
Loudon					30 719	235		
McMinn			43 710	429				
McNairy							23 337	562*

*Less than .5 psi overpressure

STATE OF TENNESSEE (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Macon							15 667	307*
Madison							76 858	558
Marion					24 502	512		
Marshall							20 095	376*
Maury							51 863	616*
Meigs					7 787	189		
Monroe							30 048	648
Montgomery	88 788	539						
Moore			4 907	129				
Morgan					17 290	523		
Obion							32 980	550
Overton							18 095	433*
Perry							6 427	412*
Pickett							4 510	159*
Polk							13 605	437
Putnam							50 464	399*
Rhea							24 819	309
Roane	49 436	357						
Robertson							38 717	476
Rutherford							97 308	605
Scott							20 635	528*
Sequatchie							8 618	266
Sevier							47 229	590*
Shelby	796 450	772						
Smith							14 564	313*
Stewart	9 154	454						
Sullivan	145 705	415						
Sumner							92 025	529
Tipton			35 021	454				
Trousdale							5 488	114*

*Less than .5 psi overpressure

STATE OF TENNESSEE (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Unicoi							16 911	186*
Union							12 358	218*
Van Buren							4 782	273*
Warren							33 436	431*
Washington	92 699	326						
Wayne							14 115	734*
Weakley							33 395	581
White							19 814	373*
Williamson							68 284	584
Wilson							61 352	571
TOTAL STATE	2 549 809	6 849	213 131	2 717	108 999	1 934	1 874 577 (888 913 (985 664	29 430 11 507) 17 923)*

*Less than .5 psi overpressure

FEMA REGION V -- DIRECT EFECTS RISK SUMMARY

Estimated 1985 Population: 45,687,087
Land Area: 323,545 square miles

	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	GT 10 PSI		EQ/GT 5PSI LT 10PSI		EQ/GT 2PSI LT 5 PSI		EQ/GT .5PSI LT 2PSI	
STATE	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Illinois	8 517 316	13 686	68 783	682	297 785	5 417	2 673 372	35 801
							(1 496 597	15 088)
							(1 176 775	20 713)*
Indiana	1 842 108	7 796	---	---	759 597	5 842	2 897 931	22 325
							(1 092 641	9 311)
							(1 805 290	13 014)*
Michigan	5 590 565	16 262	---	---	1 296 474	7 930	2 143 739	32 827
							(1 424 142	13 629)
							(719 597	19 198)*
Minnesota	2 079 535	11 751	214 648	430	73 301	2 332	1 813 747	65 034
							(158 758	6 105)
							(1 654 989	58 929)*
Ohio	6 496 446	12 365	850 066	4 999	1 487 248	6 027	1 804 873	17 615
							(1 307 105	12 099)
							(497 768	5 516)*
Wisconsin	1 561 858	4 763	120 916	273	96 613	457	3 000 166	48 931
							(821 189	7 241)
							(2 178 977	41 690)*
TOTAL REGION V	26 087 828	66 623	1 254 413	6 384	4 011 018	28 005	14 333 828	222 533
							(6 300 432	63 473)
							(8 033 396	159 060)*

*Less than .5 psi overpressure

S T A T E   O F   I L L I N O I S -- D I R E C T   E F F E C T S   R I S K

Estimated 1985 Population: 11,557,256
Land Area: 55,586 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Adams					70 543	852		
Alexander							11 799	236*
Bond							16 041	377*
Boone							28 123	282*
Brown							5 480	306
Bureau							37 832	869*
Calhoun					5 833	250		
Carroll	17 942	444						
Cass							14 387	374*
Champaign	170 697	998						
Christian							36 273	710
Clark							16 728	505
Clay							15 596	469*
Clinton							33 632	472*
Coles							52 388	509*
Cook	5 274 484	958						
Crawford	20 950	446						
Cumberland							10 918	346*
DeKalb							73 019	634*
DeWitt							17 938	397*
Douglas							19 563	417*
Du Page	711 968	337						
Edgar							21 269	623
Edwards							8 235	223
Effingham							31 633	478*

*Less than .5 psi overpressure

STATE OF ILLINOIS (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Fayette							22 339	709*
Ford					14 938	486		
Franklin							43 111	414*
Fulton							40 582	871
Gallatin							7 644	325
Green							15 939	543*
Grundy	31 503	423						
Hamilton							9 224	436*
Hancock	23 650	795						
Hardin							5 474	181*
Henderson	9 159	373						
Henry					53 526	824		
Iroquois							32 535	1 118
Jackson							61 293	590*
Jasper							11 497	496
Jefferson							38 604	570*
Jersey							20 256	373
Jo Daviess					23 263	603		
Johnson							10 149	346
Kane							298 217	524
Kankakee							99 413	678
Kendall					36 647	322		
Knox							57 954	720*
Lake	465 841	454						
La Salle	108 455	1 139						
Lawrence	18 424	374						
Lee							33 826	725*
Livingston							40 686	1 046
Logan							30 475	619
McDonough	36 265	590						

*Less than .5 psi overpressure

STATE OF ILLINOIS (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
McHenry							158 605	607
McLean							152 292	1 185
Macon							127 873	581
Macoupin							49 374	865*
Madison	247 422	728						
Marion							44 925	573*
Marshall							13 787	388*
Mason							17 943	536
Massac	14 850	241						
Menard							11 674	315
Mercer							19 385	559
Monroe					21 041	388		
Montgomery							32 096	705*
Morgan							37 146	568*
Moultrie							14 598	325*
Ogle					45 687	759		
Peoria	191 238	620						
Perry							22 442	442*
Piatt							16 400	439*
Pike							18 603	830*
Pope							4 345	374
Pulaski							8 556	203
Putnam							6 199	160*
Randolph	35 699	583						
Richland							18 653	360
Rock Island	164 903	423						
St Clair	267 819	672						
Saline							28 808	385*
Sangamon	179 013	806						
Schuyler					8 028	436		

*Less than .5 psi overpressure

STATE OF ILLINOIS (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Scott							5 978	251*
Shelby							23 698	747*
Stark							6 878	288*
Stephenson	49 795	564						
Tazewell	128 870	650						
Union							18 287	414*
Vermilion							92 625	900*
Wabash	14 342	224						
Warren							21 014	543*
Washington							15 168	563
Wayne							18 799	715*
White					18 279	497		
Whiteside			63 783	682				
Will	334 477	844						
Williamson							59 035	427*
Winnebago							249 453	515
Woodford							33 211	527
TOTAL STATE	8 517 316	13 686	68 783	682	297 785	5 417	2 673 372 (1 496 597 (1 176 775	35 801 15 088) 20 713)*

*Less than .5 psi overpressure

S T A T E O F I N D I A N A -- D I R E C T E F F E C T S R I S K

Estimated 1985 Population: 5,499,636
Land Area: 35,963 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Adams							29 889	340
Allen	287 909	659						
Bartholomew							64 218	409*
Benton							10 004	407*
Blackford							15 552	166*
Boone					39 948	424		
Brown							12 489	312*
Carroll							19 420	372
Cass					39 602	414		
Clark	89 700	376						
Clay					24 189	360		
Clinton							31 984	405
Crawford							9 847	307*
Daviess	29 889	432						
Dearborn					37 278	307		
Decatur							24 060	373*
De Kalb							32 482	364
Delaware							122 300	392*
Dubois	35 783	429						
Elkhart							143 394	466
Fayette							27 786	215*
Floyd					63 461	150		
Fountain							18 929	398*
Franklin							21 208	385
Fulton					18 858	369		

*Less than .5 psi overpressure

STATE OF INDIANA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Gibson					34 621	490		
Grant							78 305	415*
Greene	30 483	546						
Hamilton					90 684	398		
Hancock					44 449	307		
Harrison							28 777	486
Hendricks	73 600	409						
Henry							49 438	395*
Howard					84 640	293		
Huntington							34 915	366
Jackson							37 924	514*
Jasper							26 785	561*
Jay							21 544	384*
Jefferson	30 439	363						
Jennings							22 737	378
Johnson	82 426	321						
Knox					43 254	520		
Kosciusko					62 293	540		
LaGrange							28 018	380*
Lake	500 016	501						
La Porte					106 674	600		
Lawrence							41 069	452*
Madison							132 788	453
Marion	777 116	396						
Marshall							40 965	444
Martin	10 811	339						
Miami	36 512	369						
Monroe							101 351	385
Montgomery							35 828	505*
Morgan					53 958	409		

*Less than .5 psi overpressure

STATE OF INDIANA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Newton							14 572	401*
Noble							36 347	413
Ohio							5 153	87
Orange							18 661	408*
Owen							16 529	386*
Parke							16 845	444
Perry							19 057	381*
Pike	13 173	341						
Porter	126 246	419						
Posey	26 129	410						
Pulaski							13 458	435*
Putnam							30 660	482*
Randolph							28 234	454*
Ripley							25 250	447
Rush							18 766	408*
St Joseph	239 263	459						
Scott							20 313	192
Shelby							40 382	412
Spencer							21 255	400
Starke							20 993	309*
Steuben							25 018	308*
Sullivan							20 798	452
Switzerland	7 626	224						
Tippecanoe							124 393	502*
Tipton					15 688	261		
Union							6 746	163*
Vanderburgh							168 196	263
Vermillion							17 904	260
Vigo	109 571	405						
Wabash	34 816	398						

*Less than .5 psi overpressure

STATE OF INDIANA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Warren							8 969	366*
Warrick							45 743	391
Washington							22 315	516*
Wayne							72 979	404*
Wells							24 878	370
White							23 599	506*
Whitley							26 512	336
TOTAL STATE	1 842 108	7 796	---	---	759 597	5 842	2 897 931	22 325
							(1 092 641	9 311)
							(1 805 290	13 014)*

*Less than .5 psi overpressure

S T A T E   O F   M I C H I G A N - - D I R E C T   E F F E C T S   R I S K

Estimated 1985 Population: 9,030,778
Land Area: 57,019 square miles

COUNTY	VERY HIGH RISK GT 10 PSI		HIGH RISK EQ/GT 5PSI LT 10PSI		MEDIUM RISK EQ/GT 2PSI LT 5PSI		LOW/NO* RISK EQ/GT .5PSI LT 2PSI	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Alcona							9 865	679
Alger							8 715	912
Allegan							84 857	832
Alpena	31 164	568						
Antrim					16 919	480		
Arenac							15 260	368
Baraga							8 276	901*
Barry					46 620	560		
Bay	116 484	447						
Benzie							11 105	322*
Berrien	160 914	576						
Branch							38 324	508*
Calhoun	136 813	712						
Cass					47 369	496		
Charlevoix	19 648	421						
Cheboygan							20 952	720*
Chippewa	28 740	1 590						
Clare							24 955	570*
Clinton					55 108	573		
Crawford							9 904	559
Delta							39 551	1 173
Dickinson							25 983	770
Eaton					89 510	579		
Emmet					23 747	468		
Genesee					430 014	642		

*Less than .5 psi overpressure

STATE OF MICHIGAN (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Gladwin							21 607	505
Gogebic							19 217	1 105*
Grand Traverse							57 547	466*
Gratiot	39 574	570						
Hillsdale							41 565	603
Houghton	38 148	1 014						
Huron							35 867	830*
Ingham	270 681	560						
Ionia					52 503	577		
Iosco	30 680	546						
Iron							14 100	1 163*
Isabella					54 659	576		
Jackson	143 728	705						
Kalamazoo	215 916	562						
Kalkaska							11 623	563*
Kent	465 963	862						
Keweenaw					2 096	544		
Lake							8 593	568*
Lapeer							68 766	658
Leelanau							14 462	341*
Lenawee							87 729	753
Livingston							100 690	575
Luce							5 790	905*
Mackinac							10 241	1 025
Macomb	684 008	483						
Manistee							22 152	543*
Marquette	71 997	1 882						
Mason							26 439	495*
Mecosta							37 282	560*
Menominee							25 896	1 045*

*Less than .5 psi overpressure

STATE OF MICHIGAN (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Midland					76 114	525		
Missaukee							10 689	565*
Monroe	130 040	557						
Montcalm	50 284	713						
Montmorency							7 813	550*
Muskegon							155 184	507*
Newaygo							36 547	847*
Oakland	1 003 070	875						
Oceana							21 979	541*
Ogemaw	17 661	569						
Ontonagon							9 630	1 311*
Osceola							20 422	569*
Oscoda							6 914	568
Otsego							15 421	516
Ottawa					166 497	567		
Presque Isle							13 781	656
Roscommon					18 544	528		
Saginaw					216 774	815		
St Clair	137 706	734						
St Joseph							58 102	503
Sanilac							39 937	964*
Schoolcraft							8 415	1 173*
Shiawassee							67 929	541
Tuscola							54 830	812
Van Buren							66 432	612
Washtenaw	265 283	710						
Wayne	2 148 063	615						
Wexford							26 401	566*
TOTAL STATE	5 590 565	16 262	---	---	1 296 474	7 930	2 143 739	32 827
							(1 424 142	13 629)
							(719 597	19 198)*

*Less than .5 psi overpressure

STATE OF MINNESOTA -- DIRECT EFFECTS RISK

Estimated 1985 Population: 4,181,231
Land Area: 79,547 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Aitkin							13 615	1 834*
Anoka			214 648	430				
Becker							29 238	1 312*
Beltrami							33 755	2 507*
Benton							26 710	408*
Big Stone							7 694	497*
Blue Earth							51 263	749*
Brown							28 437	610*
Carlton	30 176	864						
Carver					39 822	351		
Cass							21 799	2 033*
Chippewa							14 480	584*
Chisago							28 024	417*
Clay	48 492	1 049						
Clearwater							8 958	1 000*
Cook							4 068	1 412
Cottonwood							14 015	640*
Crow Wing							43 714	1 008*
Dakota	218 358	575						
Dodge							15 445	439*
Douglas							29 249	644*
Fairbault							18 552	714*
Fillmore							21 505	862*
Freeborn							35 034	705*
Goodhue							39 373	763*

*Less than .5 psi overpressure

STATE OF MINNESOTA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Grant							6 899	547*
Hennepin	969 049	541						
Houston							18 852	564*
Hubbard							14 427	936*
Isanti							25 121	440*
Itasca							42 784	2 661*
Jackson							13 471	699*
Kanabec							12 663	527*
Kandiyohi							38 440	784*
Kittson							6 467	1 104*
Koochiching							16 344	3 108*
Lac Qui Parle							10 177	772*
Lake	11 624	2 053						
Lake of the Wood							3 775	1 296*
Le Sueur							23 743	446*
Lincoln							7 811	539*
Lyon							25 402	714*
McLeod							30 687	489*
Mahnomen							5 369	559*
Marshall							12 456	1 760
Martin							24 921	706*
Meeker							21 191	624*
Mille Lacs							18 965	578*
Morrison							30 289	1 124*
Mower							39 199	711*
Murray							10 926	702*
Nicollet							27 475	440*
Nobles							21 185	714*
Norman							8 628	877*
Olmsted							97 282	655*

*Less than .5 psi overpressure

STATE OF MINNESOTA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Otter Tail							52 568	1 973*
Pennington							13 745	618*
Pine							21 028	1 421
Pipestone							11 155	466*
Polk					33 479	1 981		
Pope							11 767	668*
Ramsey	469 833	154						
Red Lake							5 145	433*
Redwood							19 036	881*
Renville							19 875	984*
Rice							47 643	501*
Rock							10 482	483
Roseau							12 588	1 677*
St Louis	206 555	6 125						
Scott							47 955	357
Sherburne							33 369	435*
Sibley							15 312	593*
Stearns							113 166	1 338*
Steele							29 841	431*
Stevens							10 574	560*
Swift							12 526	742*
Todd							25 886	941*
Traverse							5 391	575*
Wabasha							19 538	537*
Wadena							13 856	537*
Waseca							18 502	422*
Washington	125 448	390						
Watonwan							12 366	435*
Wilkin							7 996	751*
Winona							46 636	630*

*Less than .5 psi overpressure

STATE OF MINNESOTA (Continued)

COUNTY	VERY HIGH THREAT		HIGH THREAT		MEDIUM THREAT		LOW/NO* THREAT	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Wright							62 769	672
Yellow Medicine							13 155	759*
TOTAL STATE	2 079 535	11 751	214 648	430	73 301	2 332	1 813 747	65 034
							(158 758	6 105)
							(1 654 989	58 929)*

*Less than .5 psi overpressure

STATE OF OHIO -- DIRECT EFFECTS RISK

Estimated 1985 Population: 10,638,633
Land Area: 41,006 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2ZPSI POPULATION	AREA
Adams					24 825	586		
Allen	108 246	405						
Ashland					46 416	424		
Ashtabula	100 965	703						
Athens					58 385	508		
Auglaize	43 248	398						
Belmont					81 529	537		
Brown							33 844	493
Butler			267 089	465				
Carroll	27 213	393						
Champaign							33 387	429
Clark	146 853	398						
Clermont			138 508	456				
Clinton							34 895	410*
Columbiana	11 603	534						
Coshocton	36 487	566						
Crawford							48 719	403*
Cuyahoga	1 451 046	459						
Darke			53 525	606				
Defiance							38 008	414*
Delaware							58 142	443
Erie							77 447	264
Fairfield							96 335	506
Fayette							27 400	405*
Franklin	899 877	542						

*Less than .5 psi overpressure

STATE OF OHIO (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Fulton	38 575	407						
Gallia	30 092	471						
Geauga							75 013	408*
Greene	129 410	415						
Guernsey							41 304	522
Hamilton	861 633	412						
Hancock	64 917	532						
Hardin							31 387	471
Harrison							16 159	400
Henry					28 187	415		
Highland							34 376	553*
Hocking							24 746	423*
Holmes							30 289	424*
Huron							55 072	495
Jackson							29 753	420*
Jefferson	86 780	410						
Knox							47 613	529
Lake	216 175	231						
Lawrence	62 576	456						
Licking					124 764	686		
Logan							39 597	458
Lorain	270 340	495						
Lucas	462 017	341						
Madison							34 949	467
Mahoning					279 136	417		
Marion							66 049	403*
Medina					116 655	422		
Meigs			23 696	432				
Mercer					38 647	457		
Miami							88 976	410

*Less than .5 psi overpressure

STATE OF OHIO (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Monroe			16 091	458				
Montgomery					561 738	458		
Morgan							14 056	420
Morrow							26 564	406
Muskingum			84 376	654				
Noble							11 231	399
Ottawa							39 633	253
Paulding							20 507	419*
Perry							31 855	412*
Pickaway					42 544	503		
Pike	24 296	443						
Portage							137 910	493
Preble							38 517	426
Putnam							33 276	484
Richland	128 552	497						
Ross							68 139	692
Sandusky			61 918	409				
Scioto					84 422	614		
Seneca			61 233	553				
Shelby			43 360	409				
Stark	376 852	574						
Summit	509 599	412						
Trumbull	235 536	612						
Tuscarawas							85 576	569
Union							31 017	437
Van Wert							29 833	410
Vinton							11 473	414
Warren							103 313	403
Washington	64 922	640						
Wayne			100 270	557				

*Less than .5 psi overpressure

STATE OF OHIO (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Williams							36 158	422*
Wood	108 636	619						
Wyandot							22 355	406
TOTAL STATE	6 496 446	12 365	850 066	4 999	1 487 248	6 027	1 804 873	17 615
							(1 307 105	12 099)
							(497 768	5 516)*

*Less than .5 psi overpressure

STATE OF WISCONSIN -- DIRECT EFFECTS RISK

Estimated 1985 Population: 4,779,553
Land Area: 54,424 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Adams							13 859	648*
Ashland							17 248	1 048*
Barron							39 553	865*
Bayfield							14 400	1 462*
Brown							182 756	524*
Buffalo							14 572	699*
Burnett							13 869	818*
Calumet							33 511	326*
Chippewa							53 660	1 017*
Clark							34 020	1 218*
Columbia							44 916	771
Crawford							16 679	566*
Dane	335 264	1 205						
Dodge							76 135	887*
Door							26 236	492*
Douglas	43 876	1 305						
Dunn							34 908	853*
Eau Claire							83 603	638*
Florence							4 025	486*
Fond du Lac							89 789	725*
Forest							9 364	1 011*
Grant							51 842	1 144*
Green							30 446	583
Green Lake							19 281	357*
Iowa							20 743	760*

*Less than .5 psi overpressure

STATE OF WISCONSIN (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Iron							6 280	751*
Jackson							16 607	998
Jefferson							66 968	562*
Juneau	21 336	774						
Kenosha			120 916	273				
Kewaunee							20 184	343*
La Crosse					93 613	457		
LaFayette							17 175	634*
Langlade							20 122	873*
Lincoln							28 174	886*
Manitowoc							83 201	594*
Marathon							112 970	1 559*
Marinette							40 352	1 395*
Marquette							12 737	454*
Menominee							3 832	359*
Milwaukee	951 403	241						
Monroe	36 025	904						
Oconto							30 044	1 002*
Oneida							31 238	1 130*
Outagamie							133 891	642*
Ozaukee							67 465	235
Pepin							7 643	231*
Pierce							32 390	576
Polk							34 191	919*
Portage							57 011	810*
Price							16 777	1 256*
Racine	173 954	334						
Richland							17 627	585*
Rock							138 419	724
Rusk							16 110	913*

*Less than .5 psi overpressure

STATE OF WISCONSIN (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
St Croix							45 277	723
Sauk							44 873	838
Sawyer							14 310	1 255*
Shawano							36 820	897*
Sheboygan							102 389	515*
Taylor							18 660	975*
Trempealeau							26 132	736*
Vernon							26 772	808
Vilas							17 750	867*
Walworth							70 757	556*
Washburn							13 767	815*
Washington							87 947	431
Waukesha							286 077	554
Waupaca							43 959	754*
Waushara							19 321	628*
Winnebago							133 994	449*
Wood							77 538	801*
TOTAL STATE	1 561 858	4 762	120 916	273	96 613	457	3 000 166 (821 189 (2 178 977	48 931 7 241) 41 960)*

*Less than .5 psi overpressure

F E M A   R E G I O N   V I - - D I R E C T   E F F E C T S   R I S K   S U M M A R Y

Estimated 1985 Population: 28,140,362
Land Area: 548,583 square miles

STATE	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5 PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2 PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Arkansas	684 065	5 881	122 524	3 100	126 318	3 882	1 430 734	39 219
							(143 121	2 924)
							(1 287 613	36 295)*
Louisiana	2 874 344	15 620	---	---	241 823	3 988	1 408 852	24 912
							(521 728	8 284)
							(887 124	16 628)*
New Mexico	1 096 156	40 531	---	---	17 008	2 453	347 619	78 352
							(159 355	17 476)
							(188 264	60 876)*
Oklahoma	2 162 942	17 312	72 149	930	186 705	7 887	943 123	42 527
							(487 142	20 080)
							(455 981	22 447)*
Texas	11 956 816	45 954	43 175	1 098	1 081 754	19 826	3 344 255	195 111
							(1 536 202	49 915)
							(1 808 053	145 196)*
TOTAL REGION VI	18 774 323	125 298	237 848	5 128	1 653 608	38 036	7 474 583	380 121
							(2 847 548	98 679)
							(4 627 035	281 442)*

*Less than .5 psi overpressure

STATE OF ARKANSAS -- DIRECT EFFECTS RISK

Estimated 1985 Population: 2,363,641
Land Area: 52,082 square miles

	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	GT 10 PSI		EQ/GT 5PSI LT 10PSI		EQ/GT 2PSI LT 5PSI		EQ/GT .5PSI LT 2PSI	
COUNTY	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Arkansas							24 025	1 006*
Ashley							26 615	934*
Baxter							30 117	546*
Benton							86 071	844*
Boone							28 115	584*
Bradley							13 434	654*
Calhoun					6 162	629		
Carroll							17 597	634*
Chicot							18 017	649*
Clark							23 166	867*
Clay					19 819	641		
Cleburne							19 153	551*
Cleveland							8 119	599
Columbia			27 495	767				
Conway							19 479	558*
Craighead							63 470	713*
Crawford							40 173	593*
Crittenden					50 180	599		
Cross							20 753	622*
Dallas							11 014	668*
Desha							19 698	746*
Drew							17 946	831*
Faulkner							50 628	646
Franklin							15 588	609*
Fulton							10 449	616*

*Less than .5 psi overpressure

STATE OF ARKANSAS (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Garland							74 774	657*
Grant							13 183	633*
Greene							31 370	578*
Hempstead							23 615	725*
Hot Spring							27 264	615*
Howard							13 584	574*
Independence							32 517	763*
Izard							11 018	581*
Jackson							21 479	633*
Jefferson	90 496	882						
Johnson					18 525	676		
LaFayette							10 093	518*
Lawrence							18 546	589*
Lee							15 391	602*
Lincoln							13 046	563*
Little River							14 145	516*
Logan					20 662	717		
Lonoke			37 233	783				
Madison							11 851	837*
Marion							12 601	587*
Miller			39 656	619				
Mississippi	59 199	897						
Monroe							13 383	609*
Montgomery							7 782	775*
Nevada					10 970	620		
Newton							8 207	823*
Ouachita	33 443	737						
Perry							7 924	551*
Phillips							33 653	685*
Pike							10 051	598*

*Less than .5 psi overpressure

STATE OF ARKANSAS (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Poinsett							25 939	762*
Polk							17 508	860*
Pope	42 387	820						
Prairie							10 052	656*
Pulaski	352 946	767						
Randolph							16 315	656*
St Francis							31 547	639
Saline	56 244	725						
Scott							9 906	897*
Searcy							8 941	668*
Sebastian							97 960	535*
Sevier							14 471	560*
Sharp							15 673	606*
Stone							9 766	606*
Union	49 350	1 053						
Van Buren							15 337	709*
Washington							104 872	951*
White							52 827	1 040
Woodruff							10 516	592*
Yell			18 140	931				
TOTAL STATE	684 065	5 881	122 524	3 100	126 318	3 882	1 430 734	39 219
							(143 121	2 924)
							(1 287 613	36 295)*

*Less than .5 psi overpressure

STATE OF LOUISIANA -- DIRECT EFFECTS RISK

Estimated 1985 Population: 4,525,019
Land Area: 44,520 square miles

	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	GT 10 PSI		EQ/GT 5PSI LT 10PSI		EQ/GT 2PSI LT 5PSI		EQ/GT .5PSI LT 2PSI	
COUNTY	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Acadia	59 861	657						
Allen							21 908	766
Ascension	58 862	296						
Assumption					23 808	342		
Avoyelles							43 773	846*
Beauregard							32 564	1 163
Bienville							16 855	815
Bossier	90 980	845						
Caddo	276 755	894						
Calcasieu	176 853	1 081						
Caldwell							11 466	541*
Cameron					10 180	1 417		
Catahoula							12 760	732*
Claiborne	18 483	765						
Concordia							23 966	717*
De Soto							27 693	880
East Baton Rouge	397 601	458						
East Carrol							11 376	426*
East Feliciana							20 727	455
Evangeline							35 372	667
Franklin							24 409	636*
Grant							18 370	653
Iberia							70 124	589*
Iberville	33 300	637						
Jackson							17 125	578*

*Less than .5 psi overpressure

STATE OF LOUISIANA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Jefferson	479 824	347						
Jefferson Davis	33 174	655						
LaFayette							175 046	270
LaFourche	89 854	1 141						
LaSalle							17 629	638*
Lincoln					43 102	472		
Livingston							71 703	661
Madison							15 430	631*
Morehouse							35 796	807*
Natchitoches							40 047	1 264*
Orleans	559 384	199						
Ouachita							143 485	627*
Plaquemines	26 882	1 035						
Pointe Coupee	24 933	566						
Rapides	139 793	1 341						
Red River							10 989	394*
Richland							22 884	563*
Sabine							27 588	855*
St Bernard	68 168	486						
St Charles	42 789	286						
St Helena							10 406	409*
St James	22 121	248						
St John Baptist	41 836	213						
St Landry	90 161	936						
St Martin							47 258	749
St Mary							65 424	613*
St Tammany					142 182	873		
Tangipahoa							93 622	783*
Tensas							8 292	623*
Terrebonne							103 873	1 367*

*Less than .5 psi overpressure

STATE OF LOUISIANA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Union					22 551	884		
Vermilion							54 232	1 205
Vernon	62 258	1 332						
Washington							46 376	676*
Webster	45 935	602						
West Baton Rouge	20 678	194						
West Carroll							13 224	360*
West Feliciana	13 859	406						
Winn							17 660	953*
TOTAL STATE	2 874 344	15 620	---	---	241 823	3 988	1 408 852 (521 728 (887 124	24 912 8 284) 16 628)*

*Less than .5 psi overpressure

STATE OF NEW MEXICO -- DIRECT EFFECTS RISK

Estimated 1985 Population: 1,460,783
Land Area: 121,336 square miles

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	GT 10 PSI		EQ/GT 5PSI LT 10PSI		EQ/GT 2PSI LT 5PSI		EQ/GT .5PSI LT 2PSI	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Bernalillo	456 640	1 169						
Catron							2 781	6 929*
Chaves	60 404	6 066						
Colfax							13 280	3 762*
Curry	44 347	1 408						
DeBaca							2 278	2 323*
Dona Ana	116 120	3 819						
Eddy	55 403	4 184						
Grant							27 992	3 969*
Guadalupe							4 448	3 032*
Harding							946	2 122*
Hidalgo							6 462	3 445*
Lea	68 068	4 390						
Lincoln							14 173	4 832*
Los Alamos							19 396	109
Luna							16 846	2 965*
McKinley	62 558	5 442						
Mora							4 909	1 930*
Otero	50 681	6 626						
Quay							10 634	2 874*
Rio Arriba							32 805	5 856*
Roosevelt					17 008	2 453		
Sandoval							35 678	3 707
San Juan	99 037	5 522						
San Miguel							24 909	4 709

*Less than .5 psi overpressure

STATE OF NEW MEXICO (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Santa Fe	82 898	1 905						
Sierra							9 058	4 178*
Socorro							15 027	6 625*
Taos							21 094	2 204*
Torrance							8 397	3 335
Union							5 531	3 830*
Valencia							70 975	5 616
TOTAL STATE	1 096 156	40 531	---	---	17 008	2 453	347 619	78 352
							(159 355	17 476)
							(188 264	60 876)*

*Less than .5 psi overpressure

STATE OF OKLAHOMA -- DIRECT EFFECTS RISK

Estimated 1985 Population: 3,364,919
Land Area: 68,656 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Adair							20 474	577*
Alfalfa							7 148	864
Atoka							13 806	980
Beaver					7 451	1 808		
Beckham							28 439	904
Blaine							14 513	920*
Bryan							32 184	902*
Caddo	34 998	1 286						
Canadian	71 951	902						
Carter	47 692	827						
Cherokee							34 575	748
Choctaw							16 400	763*
Cimarron							4 046	1 842*
Cleveland	160 572	529						
Coal							5 816	520*
Comanche	121 146	1 076						
Cotton							6 987	656
Craig							15 333	763*
Creek			72 149	930				
Custer							36 008	981
Delaware							28 310	720*
Dewey							6 721	1 007*
Ellis							6 483	1 232
Garfield	66 024	1 060						
Garvin	31 029	813						

*Less than .5 psi overpressure

STATE OF OKLAHOMA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Grady					46 202	1 106		
Grant							6 713	1 004
Greer							7 290	638
Harmon							4 422	537*
Harper							4 839	1 039
Haskell							11 927	570*
Hughes							15 085	805
Jackson	30 803	817						
Jefferson							8 759	769
Johnston					10 912	639		
Kay					53 759	921		
Kingfisher							16 877	906*
Kiowa							12 812	1 019
Latimer							10 152	728*
Le Flore							43 438	1 585*
Lincoln	30 539	964						
Logan							31 357	748
Love							8 154	519
McClain					25 247	581		
McCurtain							35 933	1 826*
McIntosh							17 305	599
Major							9 516	958
Marshall					11 460	372		
Mayes							35 187	644*
Murray					13 473	420		
Muskogee	70 748	815						
Noble							12 129	736*
Nowata	11 552	541						
Okfuskee							12 082	628
Oklahoma	635 696	708						

*Less than .5 psi overpressure

STATE OF OKLAHOMA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Okmulgee	40 403	698						
Osage							42 658	2 264*
Ottawa							33 882	465
Pawnee							17 176	551
Payne	65 992	691						
Pittsburg							43 109	1 251*
Pontotoc							34 762	717
Pottawatomie							62 945	783
Pushmataha							11 880	1 417*
Roger Mills							6 385	1 146
Rogers	56 007	683						
Seminole	29 055	639						
Sequoyah							33 645	678*
Stephens	46 259	885						
Texas					18 201	2 040		
Tillman							11 650	904
Tulsa	519 654	571						
Wagoner	52 032	559						
Washington							52 984	423
Washita	17 419	1 006						
Woods							10 827	1 291*
Woodward	23 371	1 242						
TOTAL STATE	2 162 942	17 312	72 149	930	186 705	7 887	943 123	42 527
							(487 142	20 080)
							(455 981	22 447)*

*Less than .5 psi overpressure

STATE OF TEXAS -- DIRECT EFFECTS RISK

Estimated 1985 Population: 16,426,000
Land Area: 261,989 square miles

	VERY HIGH RISK GT 10 PSI		HIGH RISK EQ/GT 5PSI LT 10PSI		MEDIUM RISK EQ/GT 2PSI LT 5PSI		LOW/NO* RISK EQ/GT .5PSI LT 2PSI	
COUNTY	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Anderson							47 651	1 077*
Andrews							16 609	1 501*
Angelina							69 361	807*
Aransas							17 801	280
Archer							8 179	907
Armstrong					1 937	910		
Atascosa							28 715	1 218
Austin							21 150	656
Bailey							8 227	827
Bandera							8 732	793*
Bastrop			32 710	895				
Baylor							5 126	862*
Bee	29 378	880						
Bell	169 465	1 055						
Bexar	1 117 869	1 248						
Blanco							5 508	714*
Borden							1 003	900*
Bosque							14 289	989
Bowie	80 151	891						
Brazoria	190 191	1 407						
Brazos							123 285	588
Brewster							8 213	6 169*
Briscoe							2 266	887*
Brooks							9 279	942*
Brown							36 336	936*

*Less than .5 psi overpressure

STATE OF TEXAS (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Burleson							15 837	668
Burnet							22 587	994
Caldwell	27 133	546						
Calhoun	22 997	540						
Callahan							13 009	899
Cameron	248 893	905						
Camp			10 465	203				
Carson	7 188	924						
Cass							30 977	937
Castro							10 177	899*
Chambers	20 132	616						
Cherokee							39 769	1 052
Childress							6 452	707*
Clay					9 871	1 085		
Cochran							4 732	775*
Coke							3 706	908*
Coleman							10 468	1 277*
Collin					187 101	851		
Collingsworth							4 072	909*
Colorado							20 306	964*
Comal					44 827	555		
Comanche							13 217	930*
Concho							2 977	992*
Cooke							29 097	893*
Coryell	58 932	1 057						
Cottle							2 633	895*
Crane							5 350	782
Crockett							5 035	2 806*
Crosby							8 432	898
Culberson							3 509	3 815*

*Less than .5 psi overpressure

STATE OF TEXAS (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Dallam							6 796	1 505*
Dallas	1 765 074	880						
Dawson							17 059	903*
Deaf Smith							20 205	1 497*
Delta							4 944	279*
Denton					174 001	911		
De Witt							20 656	910
Dickens							3 090	907*
Dimmit	12 065	1 307						
Donley							4 208	929*
Duval							13 548	1 795*
Eastland							21 466	924*
Ector	151 738	903						
Edwards							2 168	2 102*
Ellis							69 192	939
El Paso	538 075	1 014						
Erath							24 905	1 080*
Falls							18 274	770
Fannin							24 681	895
Fayette							20 407	950
Fisher							5 741	897*
Floyd							8 802	992*
Foard							1 849	703*
Fort Bend	191 398	876						
Franklin							7 415	294
Freestone							17 218	888*
Frio							14 644	1 133*
Gaines							14 581	1 504*
Galveston	220 241	399						
Garza							5 720	895*

*Less than .5 psi overpressure

STATE OF TEXAS (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Gillespie							15 622	1 061*
Glasscock							1 251	900*
Goliad					5 897	859		
Gonzales	19 081	1 068						
Gray					27 503	921		
Grayson							95 891	934*
Gregg	114 058	273						
Grimes							17 968	799*
Guadalupe					54 862	713		
Hale							37 243	1 005
Hall							4 963	876*
Hamilton							8 136	836*
Hansford							6 590	921*
Hardeman							6 589	688*
Hardin	44 075	898						
Harris	2 831 639	1 734						
Harrison	58 471	908						
Hartley							3 633	1 462*
Haskell							7 515	901*
Hays							51 765	678
Hemphill							6 418	903*
Henderson							52 080	888*
Hidalgo	350 518	1 569						
Hill							27 335	968*
Hockley					24 809	908		
Hood							25 815	425*
Hopkins							28 369	789
Houston							23 673	1 234*
Howard							38 311	901*
Hudspeth							2 620	4 566*

*Less than .5 psi overpressure

STATE OF TEXAS (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Hunt	65 278	840						
Hutchinson	30 287	871						
Irion							1 800	1 052*
Jack							7 639	920
Jackson					13 946	844		
Jasper					32 469	921		
Jeff Davis							1 770	2 258*
Jefferson	260 403	937						
Jim Hogg							5 464	1 136*
Jim Wells							40 710	867
Johnson							85 375	731
Jones							18 960	931
Karnes					13 498	753		
Kaufman							49 484	788
Kendall							13 788	663*
Kenedy							485	1 389*
Kent							1 100	878*
Kerr							33 638	1 107*
Kimble							4 297	1 250*
King							430	914*
Kinney							2 407	1 359
Kleberg	34 983	853						
Knox							5 583	845*
Lamar							44 953	919*
Lamb							17 077	1 013
Lampasas							13 753	714
La Salle							5 960	1 517*
Lavaca							18 238	971
Lee							14 220	631*
Leon							11 710	1 078*

*Less than .5 psi overpressure

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Liberty							55 859	1 174
Limestone							21 699	931*
Lipscomb							4 310	933*
Live Oak	9 872	1 057						
Llano					12 072	939		
Loving							75	671*
Lubbock	220 637	900						
Lynn							7 834	888
McCulloch							8 849	1 071*
McLennan	184 912	1 031						
McMullen					934	1 163		
Madison							12 236	473*
Marion					10 734	385		
Martin							5 451	914*
Mason							3 526	934*
Matagorda					37 618	1 127		
Maverick							36 420	1 287
Medina							25 049	1 331
Menard							2 408	902*
Midland					121 309	902		
Milam					23 556	1 019		
Mills							4 590	748*
Mitchell							9 286	912*
Montague							18 758	928*
Montgomery					168 161	1 047		
Moore							17 728	905
Morris	15 523	256						
Motley							1 820	959*
Nacogdoches							51 584	939*
Navarro							39 336	1 068*

*Less than .5 psi overpressure

STATE OF TEXAS (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Newton							13 436	935
Nolan							18 011	915
Nueces	305 867	847						
Ochiltree							11 484	919*
Oldham							2 436	1 485
Orange	91 432	362						
Palo Pinto							26 766	949
Panola	23 148	812						
Parker							54 135	902
Parmer							10 776	885
Pecos							17 658	4 776*
Polk							30 680	1 061*
Potter	108 666	902						
Presidio							5 405	3 857*
Rains							5 979	243
Randall					85 692	917		
Reagan							5 065	1 173*
Real							2 784	697*
Red River							15 696	1 054*
Reeves							15 924	2 626*
Refugio							9 225	771
Roberts							1 062	915*
Robertson	16 266	864						
Rockwall							20 181	128
Runnels							12 504	1 056
Rusk	44 629	932						
Sabine							9 975	486*
San Augustine							8 887	524*
San Jacinto							14 075	572*
San Patricio	64 171	693						

*Less than .5 psi overpressure

STATE OF TEXAS (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
San Saba							6 003	1 136*
Schleicher							3 314	1 309*
Scurry							20 589	900*
Shackelford							4 096	915*
Shelby							24 040	791*
Sherman							3 235	923*
Smith	148 646	932						
Somervell							4 528	188*
Starr							33 795	1 226*
Stephens							10 829	894
Sterling							1 641	923*
Stonewall							2 466	925*
Sutton							5 948	1 455*
Swisher							8 860	902*
Tarrant	1 047 540	868						
Taylor	126 136	917						
Terrell							1 465	2 357*
Terry							15 475	886*
Throckmorton							2 384	912*
Titus	23 389	412						
Tom Green	98 791	1 515						
Travis	518 971	989						
Trinity							11 631	692*
Tyler							18 854	922*
Upshur							33 233	587
Upton							5 783	1 243
Uvalde							24 016	1 564
Val Verde	41 253	3 150						
Van Zandt							37 028	855
Victoria							75 901	887

*Less than .5 psi overpressure

STATE OF TEXAS (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Walker							52 221	786*
Waller							24 262	514*
Ward							16 495	836*
Washington							25 426	610*
Webb							122 888	3 363*
Wharton							41 409	1 086
Wheeler							8 502	905*
Witchita	127 426	606						
Wilbarger							16 904	947*
Willacy							18 857	589
Williamson							101 812	1 137
Wilson					18 710	807		
Winkler							11 236	840*
Wise	31 679	902						
Wood	27 986	689						
Yoakum							9 654	800*
Young	20 063	919						
Zapata							8 344	999*
Zavala					12 247	1 289		
TOTAL STATE	11 956 816	45 954	43 175	1 098	1 081 754	19 826	3 344 255	195 111
							(1 536 202	49 915)
							(1 808 053	145 196)*

*Less than .5 psi overpressure

FEMA REGION VII -- DIRECT EFFECTS RISK SUMMARY

Estimated 1985 Population: 11,925,241
Land Area: 282,971 square miles

STATE	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Iowa	960 992	5 919	---	---	88 306	953	1 857 641	49 092
							(312 608	7 716)
							(1 545 033	41 376)*
Kansas	1 241 903	14 109	311 640	2 946	74 253	3 488	827 137	61 249
							(363 362	17 582)
							(463 775	43 667)*
Missouri	3 023 895	14 553	56 232	1 140	340 392	3 831	1 548 038	49 052
							(298 582	10 821)
							(1 249 456	38 231)*
Nebraska	420 964	7 770	11 353	2 158	448 230	2 078	734 264	64 633
							(79 485	5 168)
							(654 779	59 465)*
TOTAL REGION VII	5 647 754	42 351	379 225	6 244	951 181	10 350	4 967 080	224 026
							(1 054 037	41 287)
							(3 913 043	182 739)*

*Less than .5 psi overpressure

S T A T E   O F   I O W A -- D I R E C T   E F F E C T S   R I S K

Estimated 1985 Population: 2,906,939
Land Area: 55,964 square miles

	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	GT 10 PSI		EQ/GT 5PSI LT 10PSI		EQ/GT 2PSI LT 5PSI		EQ/GT .5PSI LT 2PSI	
COUNTY	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Adair							9 171	569*
Adams							5 535	425*
Allamakee							15 188	633*
Appanoose							14 710	498*
Audubon							8 169	444*
Benton							22 898	719
Black Hawk							136 865	573*
Boone							25 946	573*
Bremer							24 669	439*
Buchanan							22 900	572*
Buena Vista							21 016	575*
Butler							17 310	582*
Calhoun							12 866	571*
Carroll							22 915	570*
Cass							17 077	565*
Cedar							18 790	582*
Cerro Gordo							48 580	569*
Cherokee							15 621	577*
Chickasaw							15 018	505*
Clarke							8 787	431*
Clay							19 165	569*
Clayton							21 245	778*
Clinton	55 532	695						
Crawford							19 448	714*
Dallas							29 750	591

*Less than .5 psi overpressure

STATE OF IOWA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Davis							9 276	504*
Decatur							9 232	535*
Delaware							19 169	578*
Des Moines	44 964	414						
Dickinson							15 710	381*
Dubuque							91 209	607*
Emmet							12 838	394*
Fayette							24 668	731*
Floyd							18 980	502*
Franklin							12 521	583*
Fremont							9 238	515
Greene							11 579	571*
Grundy							13 743	501*
Guthrie							11 507	590*
Hamilton							17 290	576*
Hancock							13 559	571*
Hardin							21 564	569*
Harrison							15 855	698
Henry							18 755	436
Howard							10 877	473*
Humboldt							11 972	437*
Ida							8 852	432*
Iowa							15 135	587
Jackson	22 405	638						
Jasper							36 039	731*
Jefferson							16 445	440*
Johnson							85 664	614
Jones							20 530	576*
Keokuk							12 511	580*
Kossuth							21 303	974*

*Less than .5 psi overpressure

STATE OF IOWA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Lee	42 782	522						
Linn	169 437	724						
Louisa							12 205	402
Lucas							10 127	432*
Lyon							12 755	588
Madison							12 297	563
Mahaska							23 124	571*
Marion							30 300	560*
Marshall							41 544	573*
Mills	13 842	439						
Mitchell							11 817	469*
Monona							11 292	697
Monroe							8 779	434*
Montgomery							13 273	424*
Muscatine							42 285	442
O'Brien							16 817	572*
Osceola							8 173	398*
Page							18 930	535*
Palo Alto							12 148	562*
Plymouth							24 479	864
Pocahontas							10 841	577*
Polk	313 620	582						
Pottawattamie					88 306	953		
Poweshiek							18 716	585*
Ringgold							5 797	536*
Sac							13 394	576*
Scott	161 427	459						
Shelby							14 675	591*
Sioux							31 399	769*
Story							73 036	574*

*Less than .5 psi overpressure

STATE OF IOWA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Tama							18 964	722*
Taylor							8 297	537*
Union							13 855	426*
Van Buren							8 281	484
Wapello							39 386	434*
Warren	35 956	573						
Washington							20 041	570*
Wayne							7 837	527*
Webster							43 236	718*
Winnebago							12 850	401*
Winneshiek							22 264	690*
Woodbury	101 027	873						
Worth							8 906	401*
Wright							15 861	578*
TOTAL STATE	960 992	5 919	---	---	88 306	953	1 857 641	49 092
							(312 608	7 716)
							(1 545 033	41 376(*

*Less than .5 psi overpressure

S T A T E O F K A N S A S -- D I R E C T E F F E C T S R I S K S U M M A R Y

Estimated 1985 Population: 2,454,933
Land Area: 81,792 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Allen			16 160	505				
Anderson							8 867	583*
Atchison							17 964	431
Barber							7 351	1 136*
Barton							33 523	895*
Bourbon							15 817	638*
Brown	11 663	571						
Butler	47 629	1 443						
Chase							3 324	777*
Chautauqua							4 937	644*
Cherokee							22 307	590
Cheyenne							3 687	1 021*
Clark							2 726	976*
Clay							9 546	632
Cloud							12 024	718*
Coffey							10 139	615*
Comanche							2 592	790*
Cowley	37 379	1 128						
Crawford							38 049	595
Decatur							4 658	894*
Dickinson							19 972	852
Doniphan			9 005	388				
Douglas							70 265	461
Edwards							4 107	620*
Elk							3 635	650*

*Less than .5 psi overpressure

STATE OF KANSAS (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Ellis							29 004	900*
Ellsworth							6 362	717
Finney							30 041	1 302*
Ford							26 636	1 099*
Franklin							22 337	577
Geary	29 329	377						
Gove							3 688	1 072*
Graham							4 256	898*
Grant							6 782	575*
Gray							5 373	868*
Greeley			1 917	778				
Greenwood							8 732	1 135*
Hamilton							2 499	998
Harper							7 767	802*
Harvey							31 144	541
Haskell							3 876	578*
Hodgeman							2 265	860*
Jackson							11 502	658
Jefferson					16 072	536		
Jewell							4 396	916
Johnson			302 948	478				
Kearny							3 901	868
Kingman							9 141	866*
Kiowa							4 011	723*
Labette	25 690	653						
Lane							2 560	717*
Leavenworth	58 999	463						
Lincoln							3 771	720*
Linn							8 342	601
Logan							3 458	1 073

*Less than .5 psi overpressure

STATE OF KANSAS (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Lyon							38 382	844*
McPherson	27 785	900						
Marion							13 316	944*
Marshall							13 157	878*
Meade							4 652	979*
Miami							22 370	590
Mitchell							7 879	717*
Montgomery	42 372	646						
Morris							6 294	693
Morton							3 551	731*
Nemaha							11 148	719
Neosho	19 665	576						
Ness							4 719	1 075*
Norton							6 530	873
Osage					16 345	695		
Osborne							5 677	882*
Ottawa							5 823	721
Pawnee							8 369	755*
Phillips	7 276	887						
Pottawatomie	15 954	828						
Pratt							11 255	735*
Rawlins							3 990	1 069*
Reno	64 889	1 259						
Republic							7 034	719*
Rice							11 669	728
Riley	63 181	593						
Rooks							6 958	888
Rush							4 427	718*
Russell							9 344	869*
Saline	50 557	721						

*Less than .5 psi overpressure

STATE OF KANSAS (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Scott							5 905	717*
Sedgwick	385 098	1 007						
Seward	18 408	640						
Shawnee	160 006	549						
Sheridan							3 435	896*
Sherman							7 425	1 057*
Smith							5 576	897*
Stafford							5 886	788*
Stanton							2 451	681*
Stevens							4 863	727
Sumner					25 457	1 184		
Thomas							9 160	1 075
Trego							4 428	890
Wabaunsee			6 775	797				
Wallace							2 075	914
Washington							7 890	898*
Wichita	2 684	719						
Wilson					11 722	575		
Woodson					4 657	498		
Wyandotte	172 339	149						
TOTAL STATE	1 241 903	14 109	311 640	2 946	74 253	3 488	827 137	61 249
							(363 362	17 582)
							(463 775	43 667)*

*Less than .5 psi overpressure

STATE OF MISSOURI -- DIRECT EFFECTS RISK

Estimated 1985 Population: 4,968,558
Land Area: 68,576 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	VERY HIGH RISK GT 10 PSI AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	HIGH RISK EQ/GT 5PSI LT 10PSI AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	MEDIUM RISK EQ/GT 2PSI LT 5PSI AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	LOW/NO* RISK EQ/GT .5PSI LT 2PSI AREA
Adair							25 447	567*
Andrew					15 285	436		
Atchison							8 640	542*
Audrain							25 774	697*
Barry							26 082	773*
Barton							11 620	597
Bates	15 991	849						
Benton	12 507	729						
Bollinger							10 414	621*
Boone					107 479	687		
Buchanan	86 001	409						
Butler							38 514	698*
Caldwell							8 099	431*
Callaway	33 202	542						
Camden							23 226	641
Cape Girardeau							60 804	577*
Carroll							11 543	695
Carter							5 705	509*
Cass	55 154	702						
Cedar	12 412	471						
Chariton							10 258	758*
Christian							24 655	564
Clark							8 254	507
Clay	138 910	403						
Clinton							16 139	423

*Less than .5 psi overpressure

STATE OF MISSOURI (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Cole	61 687	392						
Cooper	14 592	566						
Crawford							19 043	744
Dade							7 533	491
Dallas							12 760	543*
Daviess							8 648	568*
DeKalb							8 127	425
Dent							14 934	755*
Douglas							12 608	814*
Dunklin			35 924	547				
Franklin	74 755	922						
Gasconade							13 677	521*
Gentry							7 919	493*
Greene							194 885	678*
Grundy							11 542	437*
Harrison							9 919	725*
Henry	19 582	729						
Hickory					7 044	379		
Holt							6 649	456
Howard					9 972	464		
Howell							30 461	927*
Iron							11 542	552*
Jackson	634 530	611						
Jasper							89 889	641*
Jefferson					158 515	661		
Johnson	38 244	834						
Knox							5 277	507*
LaClede							26 106	768
LaFayette	30 315	632						
Lawrence							30 322	614*

*Less than .5 psi overpressure

STATE OF MISSOURI (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Lewis							11 165	508*
Lincoln							24 138	627
Linn							15 542	620*
Livingston							15 532	537*
McDonald							15 830	541*
Macon							17 010	797*
Madison							11 008	497*
Maries							7 896	528*
Marion							29 304	438*
Mercer							4 597	454*
Miller			20 308	593				
Mississippi							15 770	410*
Moniteau	12 906	417						
Monroe							9 699	670*
Montgomery							11 566	540*
Morgan	15 540	594						
New Madrid							22 345	658
Newton							43 026	627*
Nodaway							22 573	875*
Oregon							10 036	792*
Osage							12 200	606
Ozark							8 858	731*
Pemiscot	24 155	517						
Perry							17 125	473*
Pettis	35 726	686						
Phelps							35 514	674
Pike							16 953	673*
Platte	49 863	421						
Polk					20 220	636		
Pulaski	44 051	550						

*Less than .5 psi overpressure

STATE OF MISSOURI (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Putnam							5 858	520*
Ralls							9 076	481*
Randolph							26 165	477*
Ray					21 878	568		
Reynolds							7 162	808*
Ripley							12 767	632*
St Charles	166 248	558						
St Clair	8 667	698						
Ste Genevieve							15 238	504*
St Francois							43 670	451*
St Louis	990 381	505						
Saline	25 067	755						
Schuyler							4 721	308*
Scotland							5 278	439*
Scott							40 428	423*
Shannon							8 095	1 004*
Shelby							7 652	501*
Stoddard							28 536	818*
Stone							17 337	451*
Sullivan							7 134	651*
Taney							24 151	608*
Texas							21 640	1 108
Vernon							19 850	837
Warren							16 799	429*
Washington							18 661	762*

*Less than .5 psi overpressure

STATE OF MISSOURI (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Wayne							11 804	763*
Webster							21 915	594*
Worth							2 968	266*
Wright							16 431	682*
St Louis (City)	423 409	61						
TOTAL STATE	3 023 895	14 553	56 232	1 140	340 393	3 831	1 548 038 (298 582 (1 299 456	49 052 10 821) 38 231)*

*Less than .5 psi overpressure

STATE OF NEBRASKA --DIRECT EFFECTS RISK

Estimated 1985 Population: 1,614,811
Land Area: 76,639 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Adams							31 141	564
Antelope							8 726	859*
Arthur							475	710*
Banner	1 084	747						
Blaine							775	714*
Boone							7 343	687*
Box Butte							14 324	1 077*
Boyd							3 325	532*
Brown							4 287	1 214*
Buffalo							38 764	946*
Burt							8 741	486*
Butler							9 138	584
Cass							21 808	557
Cedar							11 255	740*
Chase							4 924	893*
Cherry							6 867	5 961*
Cheyenne							10 046	1 196
Clay							7 815	574
Colfax							9 545	410*
Cuming							11 447	575*
Custer							13 677	2 571*
Dakota	17 369	258						
Dawes							9 362	1 397*
Dawson							22 298	982*
Deuel					2 358	437		

*Less than .5 psi overpressure

STATE OF NEBRASKA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Dixon							6 864	474*
Dodge							35 764	534*
Douglas					413 626	333		
Dundy							2 894	920*
Fillmore							7 732	576*
Franklin							4 293	576*
Frontier							3 632	976*
Furnas							6 536	721*
Gage							23 940	858*
Garden			2 725	1 680				
Garfield							2 422	570*
Gosper							2 160	461*
Grant							878	775*
Greeley							3 320	570*
Hall	50 376	537						
Hamilton					9 232	542		
Harlan							4 288	555*
Hayes							1 316	714*
Hitchcock							3 965	709*
Holt							14 004	2 406*
Hooker							1 024	720*
Howard							6 707	564
Jefferson							9 535	575*
Johnson							5 057	376*
Kearney							6 690	519*
Keith							9 138	1 039*
Keya Paha							1 237	769*
Kimball	4 967	952						
Knox							11 198	1 105*
Lancaster	205 512	839						

*Less than .5 psi overpressure

STATE OF NEBRASKA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Lincoln							34 217	2 525*
Logan							969	571*
Loup							897	574*
McPherson							561	859*
Madison							32 468	575*
Merrick			8 628	478				
Morrill	6 029	1 405						
Nance							4 594	439*
Nemaha							8 330	408*
Nuckolls							6 792	576*
Otoe							15 120	615*
Pawnee							3 695	432*
Perkins							3 813	885*
Phelps							10 198	540*
Pierce							8 514	575*
Platte							29 752	669*
Polk							5 973	437*
Red Willow							12 999	718*
Richardson							10 905	553
Rock							2 456	1 003*
Saline							13 066	576
Sarpy	95 470	238						
Saunders							18 574	753*
Scotts Bluff	38 419	725						
Seward					15 820	575		
Sheridan							7 807	2 453*
Sherman							3 972	564*
Sioux	1 738	2 069						
Stanton							6 437	431*
Thayer							7 463	575*

*Less than .5 psi overpressure

STATE OF NEBRASKA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Thomas							965	714*
Thurston					7 194	391		
Valley							5 871	567*
Washington							15 464	386*
Wayne							9 801	443*
Webster							4 787	575*
Wheeler							1 101	575*
York							15 046	576*
TOTAL STATE	420 964	7 770	11 353	2 158	448 230	2 078	734 264	64 633
							(79 485	5 168)
							(654 779	59 465)*

*Less than .5 psi overpressure

F E M A   R E G I O N   V I I I -- D I R E C T   E F F E C T S   R I S K   S U M M A R Y

Estimated 1985 Population: 7,709,731
Land Area: 573,497 square miles

STATE	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Colorado	2 129 554	21 244	420 758	768	11 157	559	688 649	81 081
							(174 065	19 414)
							(514 044	61 677)*
Montana	419 999	47 939	---	---	30 641	13 978	382 232	83 448
							(83 619	20 524)
							(298 613	69 924)*
North Dakota	481 812	33 890	11 496	3 744	4 752	1 036	199 516	30 674
							(65 257	5 394)
							(134 259	25 280)*
South Dakota	290 207	20 782	2 493	1 969	---	---	416 028	53 205
							(47 051	10 623)
							(368 977	42 582)*
Utah	1 137 432	17 388	28 848	4 479	71 167	5 069	461 420	55 158
							(282 697	9 366)
							(178 723	45 792)*
Wyoming	313 177	51 368	6 058	2 856	5 572	4 871	196 763	37 991
							(30 328	4 286)
							(166 435	33 705)*
TOTAL REGION VIII	4 772 181	192 611	469 653	13 816	123 289	25 513	1 944 608	341 557
							(683 017	69 607)
							(1 261 591	271 950)*

*Less than .5 psi overpressure

S T A T E   O F   C O L O R A D O -- D I R E C T S   E F F E C T S   R I S K

Estimated 1985 Population: 3,250,118
Land Area: 103,652 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Adams	277 973	1 235						
Alamosa							12 588	719*
Arapahoe	378 836	800						
Archuleta							5 798	1 353*
Baca							5 133	2 554*
Bent							5 913	1 008*
Boulder	213 665	742						
Chaffee							12 793	1 008*
Cheyenne							2 475	1 783*
Clear Creek							7 283	397*
Conejos							8 148	1 285*
Costilla							3 564	1 227*
Crowley							3 282	790*
Custer							1 952	740*
Delta							24 615	1 141*
Denver	507 548	111						
Dolores							1 792	1 064*
Douglas							35 853	841*
Eagle							17 085	1 690*
Elbert							8 500	1 851
El Paso	358 941	2 129						
Fremont							31 488	1 538
Garfield							28 651	2 952
Gilpin							2 822	149
Grand							9 077	1 854*

*Less than .5 psi overpressure

STATE OF COLORADO (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Gunnison							10 471	3 238*
Hinsdale							531	1 115*
Huerfano							7 187	1 583*
Jackson							1 732	1 615*
Jefferson			420 750	1 615				
Kiowa							1 947	1 758*
Kit Carson							7 960	2 160*
Lake							6 762	379*
La Plata							31 744	1 692
Larimer							169 855	2 604*
Las Animas							14 778	4 771*
Lincoln							4 547	2 586*
Logan	19 921	1 819						
Mesa	98 752	3 309						
Mineral							808	877*
Moffat	15 593	4 732						
Montezuma							20 001	2 083*
Montrose							26 409	2 240*
Morgan							23 440	1 276
Otero							22 191	1 247*
Ouray							2 241	542*
Park							7 201	2 192*
Phillips							4 653	688*
Pitkin							10 356	968*
Prowers							14 492	1 629*
Pueblo	124 546	2 377						
Rio Blanco							6 960	3 222*
Rio Grande							11 468	913*
Routt							13 951	2 267
Saguache							4 141	3 176*

*Less than .5 psi overpressure

STATE OF COLORADO (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
San Juan							1 085	388
San Miguel							3 006	1 287
Sedgwick							3 187	540
Summit							11 192	607
Teller					11 157	559		
Washington							5 548	2 520
Weld	133 779	3 990						
Yuma							9 991	2 365
TOTAL STATE	2 129 554	21 244	420 758	768	11 157	559	688 649	81 081
							(174 605	19 414)
							(514 044	61 677)*

*Less than .5 psi overpressure

STATE OF MONTANA -- DIRECT EFFECTS RISK

Estimated 1985 Population: 832,872
Land Area: 145,365 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Beaverhead							8 849	5 529*
Big Horn							11 639	4 983
Blaine	7 056	4 259						
Broadwater							3 459	1 188*
Carbon					8 734	2 056		
Carter					1 751	3 342		
Cascade	82 077	2 699						
Chouteau	6 186	3 988						
Custer							13 535	3 776*
Daniels							2 758	1 427*
Dawson							12 939	2 347*
Deer Lodge							10 873	740*
Fallon							3 767	1 623*
Fergus	12 880	4 340						
Flathead							54 349	5 112*
Gallatin							48 749	2 510*
Garfield							1 704	4 491*
Glacier	11 450	2 995						
Golden Valley	1 114	1 172						
Granite							2 841	1 729*
Hill							18 678	2 897*
Jefferson					8 286	1 656		
Judith Basin	2 716	1 871						
Lake							20 728	1 493
Lewis and Clark	46 434	3 461						

*Less than .5 psi overpressure

STATE OF MONTANA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Liberty	2 597	1 427						
Lincoln							18 885	3 616*
McCone							2 703	2 626
Madison							5 933	3 590*
Meagher							2 247	2 392
Mineral							3 694	1 216*
Missoula	76 535	2 582						
Musselshell							4 373	1 871*
Park							13 373	2 665
Petroleum							676	1 652
Phillips					5 756	5 131		
Pondera	7 155	1 632						
Powder River							2 471	3 288*
Powell							6 849	2 329
Prairie							1 873	1 732*
Ravalli							25 404	2 384
Richland							14 890	2 081*
Roosevelt	11 848	2 357						
Rosebud							13 959	5 019*
Sanders							9 326	2 749*
Sheridan	6 072	1 681						
Silver Bow							34 471	719*
Stillwater					6 114	1 793		
Sweetgrass							3 321	1 856*
Teton	6 424	2 275						
Toole	5 784	1 931						
Treasure							1 019	975*
Valley	9 916	4 936						
Wheatland	2 291	1 419						
Wibaux							1 496	888*

*Less than .5 psi overpressure

STATE OF MONTANA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Yellowstone	121 398	2 624						
Yellowstone National	66	245						
TOTAL STATE	419 999	47 939	---	---	30 641	13 978	382 232	83 448
							(83 619	20 524)
							(298 613	62 924)*

*Less than .5 psi overpressure

STATE OF NORTH DAKOTA -- DIRECT EFFECTS RISK

Estimated 1985 Population: 697,576
Land Area: 69,344 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Adams							3 494	988
Barnes	13 666	1 498						
Benson	8 099	1 412						
Billings							1 332	1 152*
Bottineau	9 120	1 668						
Bowman							4 334	1 162*
Burke	3 655	1 118						
Burleigh	60 173	1 618						
Cass	97 117	1 767						
Cavalier	7 029	1 507						
Dickey							6 876	1 139*
Divide	3 200	1 288						
Dunn							5 380	1 993*
Eddy	3 230	634						
Emmons							5 692	1 499*
Foster							4 564	640
Golden Valley							2 688	1 003*
Grand Forks	69 331	1 440						
Grant							4 147	1 660*
Griggs	3 631	780						
Hettinger	3 954	1 133						
Kidder							3 777	1 362*
La Moure							6 037	1 150*
Logan							3 203	1 000*
McHenry	7 432	1 887						

*Less than .5 psi overpressure

STATE OF NORTH DAKOTA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
McIntosh							4 406	984*
McKenzie			8 890	2 754				
McLean	13 042	2 065						
Mercer							16 279	1 044
Morton	27 044	1 920						
Mountrail	8 188	1 837						
Nelson	4 946	991						
Oliver							2 724	723
Pembina	10 129	1 120						
Pierce							5 998	1 037*
Ramsey	13 031	1 241						
Ransom							6 452	862*
Renville	3 555	874						
Richland							20 230	1 436*
Rolette							13 300	914*
Sargent							5 186	858*
Sheridan			2 606	990				
Sioux							3 753	1 099*
Slope							1 148	1 219*
Stark							28 911	1 338
Steele	2 896	714						
Stutsman							23 547	2 263*
Towner					4 752	1 036		
Traill							9 285	861
Walsh	15 579	1 290						
Ward	65 495	2 041						
Wells							6 793	1 288*
Williams	28 270	2 047						
TOTAL STATE	481 812	33 890	11 496	3 744	4 752	1 036	199 516	30 674
							(65 257	5 394)
							(134 259	25 280)*

*Less than .5 psi overpressure

STATE OF SOUTH DAKOTA -- DIRECT EFFECTS RISK

Estimated 1985 Population: 708,728
Land Area: 75,956 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	VERY HIGH RISK GT 10 PSI AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	HIGH RISK EQ/GT 5PSI LT 10PSI AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	MEDIUM RISK EQ/GT 2PSI LT 5PSI AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	LOW/NO* RISK EQ/GT .5PSI LT 2PSI AREA
Aurora							3 435	707*
Beadle							18 136	1 259*
Bennett							3 313	1 181*
Bon Homme							7 814	552*
Brookings							25 165	795*
Brown							36 712	1 722*
Brule							5 408	815*
Buffalo							1 685	476*
Butte	8 125	2 251						
Campbell							2 274	732*
Charles Mix							9 719	1 090*
Clark							4 950	953*
Clay							13 647	408*
Codington							22 368	695*
Corson							5 243	2 467*
Custer							6 795	1 559
Davison							17 806	436*
Day							7 893	1 022*
Deuel							5 203	631*
Dewey							5 487	2 310*
Douglas							3 894	434*
Edmunds							4 933	1 149*
Fall River							7 820	1 740*
Faulk							3 312	1 003*
Grant							9 582	681*

*Less than .5 psi overpressure

STATE OF SOUTH DAKOTA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Gregory							5 871	1 041*
Haakon	2 965	1 822						
Hamlin							5 251	512*
Hand							4 701	1 437*
Hanson							3 290	433*
Harding							1 889	2 678
Hughes	14 830	757						
Hutchinson							9 045	816*
Hyde							1 909	860*
Jackson	3 266	1 872						
Jerauld							2 728	530*
Jones							1 500	971
Kingsbury							6 493	824*
Lake							11 002	560*
Lawrence	19 380	800						
Lincoln	14 384	578						
Lyman							3 892	1 679
McCook							6 234	576*
McPherson							3 766	1 148*
Marshall							5 209	848*
Meade	21 716	3 481						
Mellette	2 365	1 311						
Miner							3 482	570*
Minnehaha	120 296	810						
Moody							6 964	520*
Pennington	75 780	2 783						
Perkins	4 649	2 885						
Potter							3 715	869*
Roberts							11 063	1 102*
Sanborn							3 093	569*

*Less than .5 psi overpressure

STATE OF SOUTH DAKOTA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Shannon							11 207	2 094
Spink							9 081	1 505*
Stanley	2 451	1 432						
Sully							1 868	972
Todd							7 256	1 388*
Tripp							7 188	1 618*
Turner							9 126	617
Union							10 774	453
Walworth							6 624	707*
Yankton							19 123	518*
Ziebach			2 493	1 969				
TOTAL STATE	290 207	20 782	2 493	1 969	---	---	416 028	53 205
							(47 051	10 623)
							(368 977	42 582)*

*Less than .5 psi overpressure

STATE OF UTAH -- DIRECT EFFECTS RISK

Estimated 1985 Population: 1,698,867
Land Area: 82,094 square miles

COUNTY	VERY HIGH RISK GT 10 PSI		HIGH RISK EQ/GT 5PSI LT 10PSI		MEDIUM RISK EQ/GT 2PSI LT 5PSI		LOW/NO* RISK EQ/GT .5PSI LT 2PSI	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Beaver							5 280	2 586*
Box Elder	37 769	5 614						
Cache					66 658	1 171		
Carbon							26 132	1 479*
Daggett							856	699*
Davis	174 969	299						
Duchesne	16 271	3 234						
Emery							13 911	4 449*
Garfield							4 319	4 449*
Grand							7 957	3 689
Iron							20 357	3 302*
Juab							6 274	3 396*
Kane					4 509	3 898		
Millard							13 762	6 818*
Morgan							5 285	603
Piute							1 476	759*
Rich							2 638	1 034*
Salt Lake	716 909	756						
San Juan							12 096	7 725*
Sanpete							17 343	1 586*
Sevier							16 360	1 910*
Summit							13 230	1 865
Tooele	29 408	6 919						
Uintah			29 848	4 479				
Utah							246 181	2 018

*Less than .5 psi overpressure

STATE OF UTAH (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Wasatch							10 044	1 191
Washington							34 783	2 422*
Wayne							2 136	2 461*
Weber	162 106	566						
TOTAL STATE	1 137 432	17 388	28 848	4 479	71 167	5 069	461 420 (282 697 (178 723	55 158 9 366) 45 792)*

*Less than .5 psi overpressure

S T A T E   O F   W Y O M I N G -- D I R E C T   E F F E C T S   R I S K

Estimated 1985 Population: 521,570
Land Area: 97,086 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Albany							30 328	4 286
Big Horn	12 559	3 139						
Campbell							37 605	4 796*
Carbon	20 407	7 878						
Converse	15 207	4 271						
Crook			6 058	2 856				
Fremont							36 886	9 181*
Goshen	12 430	2 186						
Hot Springs							6 119	2 005*
Johnson							7 107	4 166*
Laramie	73 254	2 864						
Lincoln	15 176	4 070						
Natrona	75 746	5 247						
Niobrara							3 358	2 685*
Park	25 213	6 936						
Platte	9 369	2 023						
Sheridan							27 466	2 532*
Sublette					5 572	4 871		
Sweetwater	45 791	10 352						
Teton							11 553	4 012*
Uinta							26 235	2 085*
Washakie							10 106	2 243*
Weston	8 025	2 402						
TOTAL STATE	313 177	51 368	6 058	2 856	5 572	4 871	196 763	37 991
							(30 328	4 286)
							(166 435	33 705)*

* Less than .5 psi overpressure

F E M A   R E G I O N   I X -- D I R E C T   E F F E C T S   R I S K   S U M M A R Y

Estimated 1985 Population: 31,504,342
Land Area: 386,970 square miles

STATE	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Arizona	2 736 846	66 420	---	---	123 720	6 851	278 422	40 549
							(53 418	11 211)
							(225 004	29 388)*
California	23 833 741	87 405	---	---	1 192 975	15 170	1 079 128	53 700
							(728 659	19 776)
							(350 469	33 924)*
Hawaii			[DATA AVAILABLE SEPARATELY]					
Nevada	837 864	37 489	---	---	37 553	2 751	62 774	69 691
							(3 408	3 851)
							(59 366	65 840)*
American Samoa			[DATA AVAILABLE SEPARATELY]					
Guam			[DATA AVAILABLE SEPARATELY]					
Trust Territory			[DATA AVAILABLE SEPARATELY]					
TOTAL REGION IX	27 408 451	191 318	---	---	1 354 248	24 772	1 420 324	163 940
							(785 485	34 838)
							(634 839	129 102)*

*Less than .5 psi overpressure

STATE OF ARIZONA -- DIRECT EFFECTS RISK

Estimated 1985 Population: 3,138 988
Land Area: 113,550 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Apache							53 418	11 211
Cochise	95 247	6 219						
Coconino	85 381	18 608						
Gila							38 830	4 753*
Graham							23 316	4 631*
Greenlee							9 640	1 837*
Maricopa	1 766 060	9 127						
Mohave	71 818	13 285						
Navajo							72 022	9.995*
Pima	610 597	9 187						
Pinal					102 303	5 343		
Santa Cruz					21 417	1 238		
Yavapai							81 196	8 122*
Yuma	107 743	9 994						
TOTAL STATE	2 736 846	66 420	---	---	123 770	6 581	278 422	40 549
							(53 418	11 211)
							(225 004	29 388)*

*Less than .5 psi overpressure

S T A T E   O F   C A L I F O R N I A -- D I R E C T   E F F E C T S   R I S K

Estimated 1985 Population: 26,105,844
Land Area: 156,279 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	 AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	 AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	 AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	 AREA
Alameda	1 190 343	736						
Alpine							1 141	739*
Amador							22 813	589
Butte							162 165	1 646
Calaveras							26 876	1 021
Colusa							14 543	1 153*
Contra Costa	708 382	730						
Del Norte	18 370	1 007						
El Dorado							102 112	1 715
Fresno	574 401	5 978						
Glenn							22 999	1 319*
Humboldt					112 294	3 579		
Imperial	104 881	4 173						
Inyo							18 372	10 223*
Kern	477 128	8 130						
Kings	83 706	1 392						
Lake							47 940	1 262*
Lassen	24 433	4 553						
Los Angeles	8 006 962	4 070						
Madera							76 585	2 145
Marin	224 538	523						
Mariposa							13 230	1 456
Mendocino	72 881	3 512						
Merced	159 970	1 944						
Modoc							9 810	4 046*

*Less than .5 psi overpressure

STATE OF CALIFORNIA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Mono							9 243	3 019*
Monterey	326 370	3 303						
Napa					102 667	744		
Nevada							68 276	960
Orange	2 111 396	798						
Placer					137 111	1 416		
Plumas					18 745	2 573		
Riverside	805 521	7 214						
Sacramento	887 649	971						
San Benito							30 158	1 388
San Bernardino	1 068 239	20 064						
San Diego	2 114 283	4 212						
San Francisco	721 187	46						
San Joaquin	411 407	1 415						
San Luis Obispo	184 867	3 308						
San Mateo	609 317	447						
Santa Barbara	328 764	2 748						
Santa Clara	1 390 579	1 293						
Santa Cruz					210 206	446		
Shasta							129 180	3 786*
Sierra							3 403	959
Siskiyou							42 324	6 281
Solano	273 235	834						
Sonoma					332 912	1 604		
Stanislaus	303 105	1 506						
Sutter							58 181	602
Tehama							44 142	2 953*
Trinity							13 486	3 190*
Tulare					279 040	4 808		
Tuolumne							39 613	2 234*

*Less than .5 psi overpressure

STATE OF CALIFORNIA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Ventura	598 564	1 862						
Yolo							122 536	1 014
Yuba	53 263	640						
TOTAL STATE	23 833 741	87 409	---	---	1 192 975	15 170	1 079 128 (728 659 (350 469	53 700 19 776) 33 924)*

*Less than .5 psi overpressure

S T A T E   O F   H A W A I I - - D I R E C T   E F F E C T S   R I S K

Estimated 1985 Population: 1,057,270
Land Area: 6,427 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Hawaii	[DATA AVAILABLE SEPARATELY]						109 953	4 034
Honolulu	[DATA AVAILABLE SEPARATELY]						815 900	597
Kalawao	[DATA AVAILABLE SEPARATELY]						144	14
Kauai	[DATA AVAILABLE SEPARATELY]						45 191	620
Maui	[DATA AVAILABLE SEPARATELY]						86 082	1 162
TOTAL STATE	---	---	---	---	---	---	1 057 270	6 427

*Less than .5 psi overpressure

STATE OF NEVADA -- DIRECT EFFECTS RISK

Estimated 1985 Population: 938,191
Land Area: 109,895 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	 AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	 AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	 AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	 AREA
Churchill	14 479	4 990						
Clark	554 764	7 881						
Douglas					21 345	708		
Elko							21 012	17 135*
Esmeralda							1 531	3 587
Eureka							1 342	4 175*
Humboldt							11 285	9 698*
Lander							4 455	5 515*
Lincoln							3 493	10 635*
Lyon					16 208	2 007		
Mineral							5 961	3 744*
Nye	15 772	18 155						
Pershing							3 587	6 036*
Storey							1 877	264
Washoe	215 966	6 317						
White Pine							8 231	8 902*
Carson City (Ind)	36 883	146						
TOTAL STATE	837 864	37 489	---	---	37 553	2 715	62 774	69 691
							(3 408	3 851)
							(59 366	65 840)*

*Less than .5 psi overpressure

TERRITORY OF AMERICAN SAMOA -- DIRECT EFFECTS RISK

Estimated 1980 Population: 35,000
Land Area: 77 square miles

COUNTY	VERY HIGH RISK GT 10 PSI		HIGH RISK EQ/GT 5PSI LT 10PSI		MEDIUM RISK EQ/GT 2PSI LT 5PSI		LOW/NO* RISK EQ/GT .5PSI LT 2PSI	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Entire Territory	....................[DATA AVAILABLE SEPARATELY]..................						35 000	77
TOTAL TERRITORY	---	---	---	---	---	---	35 000	77

*Less than .5 psi overpressure

TERRITORY OF GUAM -- DIRECT EFFECTS RISK

Estimated 1985 Population: 112,900
Land Area: 209 square miles

COUNTY	VERY HIGH RISK GT 10 PSI		HIGH RISK EQ/GT 5PSI LT 10PSI		MEDIUM RISK EQ/GT 2PSI LT 5PSI		LOW/NO* RISK EQ/GT .5PSI LT 2PSI	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Entire Territory	...................[DATA AVAILABLE SEPARATELY]...................						112 900	209
TOTAL TERRITORY	---	---	---	---	---	---	112 900	209

*Less than .5 psi overpressure

U.S. TRUST TERRITORY -- DIRECT EFFECTS RISK

Estimated 1980 Population: 116,149
Land Area: 533 square miles

	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW/NO* RISK	
	GT 10 PSI		EQ/GT 5PSI LT 10PSI		EQ/GT 2PSI LT 5PSI		EQ/GT .5PSI LT 2PSI	
COUNTY	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Entire Territory	..................[DATA AVAILABLE SEPARATELY]...................						116 149	533
TOTAL TERRITORY	---	---	---	---	---	---	116 149	533

*Less than .5 psi overpressure

F E M A   R E G I O N   X -- D I R E C T   E F F E C T S   R I S K   S U M M A R Y

Estimated 1985 Population: 8,634,750
Land Area: 815,946 square miles

STATE	VERY HIGH RISK GT 10 PSI		HIGH RISK EQ/GT 5PSI LT 10 PSI		MEDIUM RISK EQ/GT 2PSI LT 5PSI		LOW/NO* RISK EQ/GT .5PSI LT 2PSI	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Alaska	........................[DATA AVAILABLE SEPARATELY].................................							
Idaho	363 270	8 838	22 102	468	105 730	3 336	523 179	69 277
							(144 356	11 652)
							(378 823	57 625)*
Oregon	1 043 460	14 949	45 358	741	532 016	4 639	1 063 092	75 858
							(277 287	10 664)
							(785 885	65 194)*
Washington	3 838 312	38 943	---	---	63 737	2 330	500 223	25 239
							(231 863	13 409)
							(208 360	23 930)*
TOTAL REGION X	5 245 042	62 730	67 460	1 209	701 483	10 305	2 086 494	170 374
							(653 506	35 725)
							(1 432 988	134 649)*

*Less than .5 psi overpressure

STATE OF ALASKA -- DIRECT EFFECTS RISK

Estimated 1985 Population: 534,271
Land Area: 570,833 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Aleutian Islands							7 066	10 890
Anchorage							239 699	1 732
Bethel	[DATA						12 358	36 104
Bristol Bay							1 142	531
Dillingham							4 988	46 042
Fairbanks North							64 320	7 404
Haines							1 997	2 374
Juneau		AVAILABLE					24 835	2 626
Kenai Peninsula							43 080	16 056
Ketchikan Gateway							13 381	1 242
Kobuk							5 768	31 593
Kodiak Island							17 229	4 796
Matanuska-Susitna			SEPARATELY]				32 533	24 502
Nome							7 758	23 871
North Slope							5 303	90 955
Prince of Wales							5 077	7 660
Sitka							7 344	2 938
Skagway-Yakutat							4 068	13 239
SE Fairbanks							6 428	24 169
Valdez-Cordova							8 583	39 229
Wade Hampton							5 725	17 816
Wrangell-Petersburg							6 396	5 965
Yukon-Koyukuk							9 193	159 099
TOTAL STATE	---	---	---	---	---	---	534 271	570 833

S T A T E O F I D A H O -- D I R E C T E F F E C T S R I S K

Estimated 1985 Population: 1,014,281
Land Area: 82,414 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Ada	193 281	1 052						
Adams							3 432	1 362*
Bannock	69 355	1 112						
Bear Lake							7 181	990
Benewah							8 678	784
Bingham					38 633	2 096		
Blaine							13 418	2 635*
Boise							2 907	1 901
Bonner							26 862	1 727*
Bonneville	69 727	1 840						
Boundary							7 620	1 268*
Butte							3 359	2 236*
Camas							765	1 071*
Canyon							88 722	584
Caribou	8 673	1 763						
Cassia							21 278	2 560*
Clark							779	1 763*
Clearwater							10 291	2 236*
Custer							6 866	4 927*
Elmore	22 234	3 071						
Franklin							9 856	664*
Fremont							10 996	1 852*
Gem							11 460	558
Gooding							12 580	728*
Idaho							14 527	8 497*

*Less than .5 psi overpressure

STATE OF IDAHO (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Jefferson							16 569	1 093
Jerome							16 212	601*
Kootenai					67 097	1 240		
Latah							30 625	1 077*
Lemhi							7 891	4 564*
Lewis							3 922	478*
Lincoln							3 756	1 205*
Madison							22 102	468*
Minidoka							21 531	758*
Nez Perce							33 254	845*
Oneida							3 539	1 200*
Owyhee							8 839	7 643
Payette							15 937	405*
Power			6 852	1 403				
Shoshone							16 897	2 641*
Teton							3 302	448*
Twin Falls							56 904	1 944*
Valley							7 000	3 670*
Washington							8 572	1 454*
TOTAL STATE	363 270	8 838	22 102	468	105 730	3 336	523 179 (144 356 (378 823	69 277 11 652) 57 625)*

*Less than .5 psi overpressure

STATE OF OREGON -- DIRECT EFFECTS RISK

Estimated 1985 Population: 2,683,926
Land Area: 96,187 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Baker							16 399	3 072*
Benton							65 950	679*
Clackamas					255 328	1 870		
Clatsop	32 360	805						
Columbia	37 060	651						
Coos	60 458	1 606						
Crook							13 003	2 984*
Curry							16 878	1 629
Deschutes							65 782	3 025*
Douglas							91 809	5 044
Gilliam							1 883	1 213*
Grant							8 231	4 525*
Harney							6 989	10 174*
Hood River							16 536	521*
Jackson							136 961	2 787*
Jefferson							12 797	1 789*
Josephine							64 672	1 640*
Klamath	58 300	5 954						
Lake							7 880	8 251*
Lane							264 127	4 562*
Lincoln							37 132	980
Linn							90 056	2 296
Malheur							29 073	9 861*
Marion	211 140	1 184						
Morrow					7 813	2 044		

*Less than .5 psi overpressure

STATE OF OREGON (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Multnomah	561 570	431						
Polk			45 358	741				
Sherman							2 294	827*
Tillamook	21 679	1 101						
Umatilla	60 893	3 217						
Union							24 745	2 036*
Wallowa							7 595	3 150*
Wasco							22 521	2 385*
Washington					268 875	725		
Wheeler							1 489	1 713*
Yamhill							58 290	715
TOTAL STATE	1 043 460	14 949	45 358	741	532 016	4 639	1 063 092	75 858
							(277 287	10 664)
							(785 885	65 194)*

*Less than .5 psi overpressure

STATE OF WASHINGTON -- DIRECT EFFECTS RISK

Estimated 1985 Population: 4,402,272
Land Area: 66,512 square miles

COUNTY	VERY HIGH RISK GT 10 PSI POPULATION	AREA	HIGH RISK EQ/GT 5PSI LT 10PSI POPULATION	AREA	MEDIUM RISK EQ/GT 2PSI LT 5PSI POPULATION	AREA	LOW/NO* RISK EQ/GT .5PSI LT 2PSI POPULATION	AREA
Adams							13 664	1 922
Asotin							17 309	635*
Benton	113 359	1 715						
Chelan							49 587	2 915*
Clallam	52 381	1 753						
Clark	207 459	627						
Columbia							4 031	864*
Cowlitz	79 164	1 139						
Douglas							24 068	1 817*
Ferry							6 023	2 200*
Franklin					36 914	1 243		
Garfield							2 567	706*
Grant	52 678	2 660						
Grays Harbor							64 224	1 918
Island	48 374	212						
Jefferson	17 748	1 805						
King	1 337 360	2 128						
Kitsap	169 172	393						
Kittitas							25 016	2 308
Klickitat							16 603	1 880*
Lewis							57 735	2 409*
Lincoln							9 627	2 310
Mason							35 586	961
Okanogan							33 037	5 281*
Pacific					17 922	908		

*Less than .5 psi overpressure

STATE OF WASHINGTON (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW/NO* RISK POPULATION	LOW/NO* RISK AREA
Pend Oreille							8 902	1 400*
Pierce	523 288	1 675						
San Juan					8 901	179		
Skagit	70 097	1 735						
Skamania							7 467	1 672*
Snohomish	375 615	2 098						
Spokane	355 552	1 764						
Stevens							31 565	2 468
Thurston	141 832	727						
Wahkiakum							3 681	261
Walla Walla							48 500	1 261
Whatcom	113 087	2 125						
Whitman							41 031	2 151*
Yakima	181 146	4 287						
TOTAL STATE	3 838 312	38 943	---	---	63 737	2 330	500 223 (231 863 (208 360	25 239 13 409) 23 930)*

*Less than .5 psi overpressure

FEDERAL EMERGENCY MANAGEMENT AGENCY

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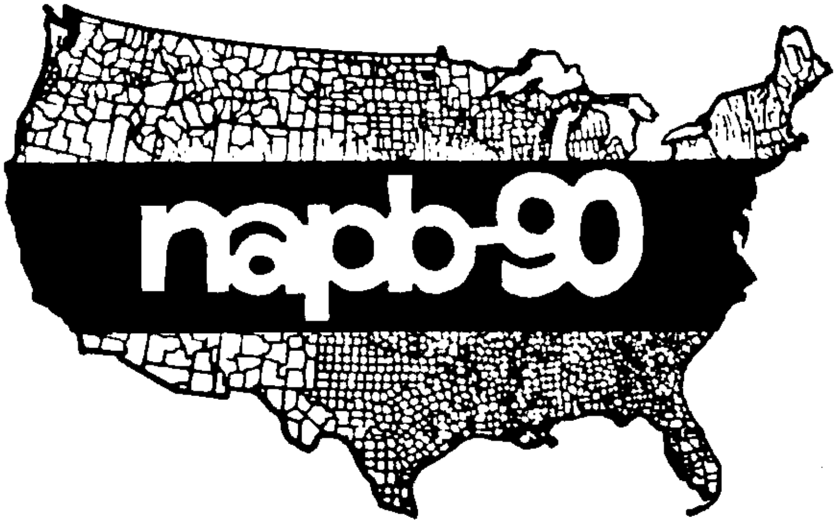
Annex B
Fallout Risk
Statistics & Maps



ANNEX B - FALLOUT RISK

This Annex provides summaries of the fallout risk to U.S. resident population and land area by State counties. For a discussion of the methodology employed to obtain this data, see Part 3., "Risk Definitions."

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*Interim data; to be corrected

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Kansas B-171*
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Montana B-195
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Utah B-207
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REGION IX Fallout Risk Summary B-213
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California B-217
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REGION X Fallout Risk Summary B-231
Alaska B-233
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Oregon B-239
Washington B-243

*Interim data; to be corrected

[A NATIONAL FALLOUT RISK MAP WILL BE PUBLISHED SEPARATELY]

NATIONAL FALLOUT RISK SUMMARY

Estimated 1985 Population: 242,109,419
Land Area: 3,551,226 square miles

	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
FEMA REGION	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Region I	---	---	---	---	1 900 820	13 044	10 419 387	48 638
Region II	---	---	---	---	1 091 500	10 398	27 534 618	48 038
Region III	---	---	---	---	489 309	2 487	24 609 567	118 063
Region IV*	58 176	995	10 023 786	72 614	8 873 497	85 897	23 487 246	219 540
Region V	1 302 116	40 280	8 947 930	119 939	28 512 850	135 959	6 924 191	27 367
Region VI*	313 222	8 955	4 879 207	98 751	6 518 856	103 069	16 429 077	337 808
Region VII*	4 876 949	140 887	6 980 657	131 586	87 635	10 498	---	---
Region VIII	1 620 896	209 611	3 159 198	140 926	2 080 308	112 806	849 329	110 154
Region IX	1 351 111	20 941	14 558 057	52 204	9 492 568	72 277	6 102 606	241 548
Region X	---	---	640 633	8 387	3 571 884	72 376	4 442 233	735 183
NATIONAL TOTALS*	9 522 470	421 669	49 189 468	624 407	62 619 227	618 811	120 778 254	1 886 339

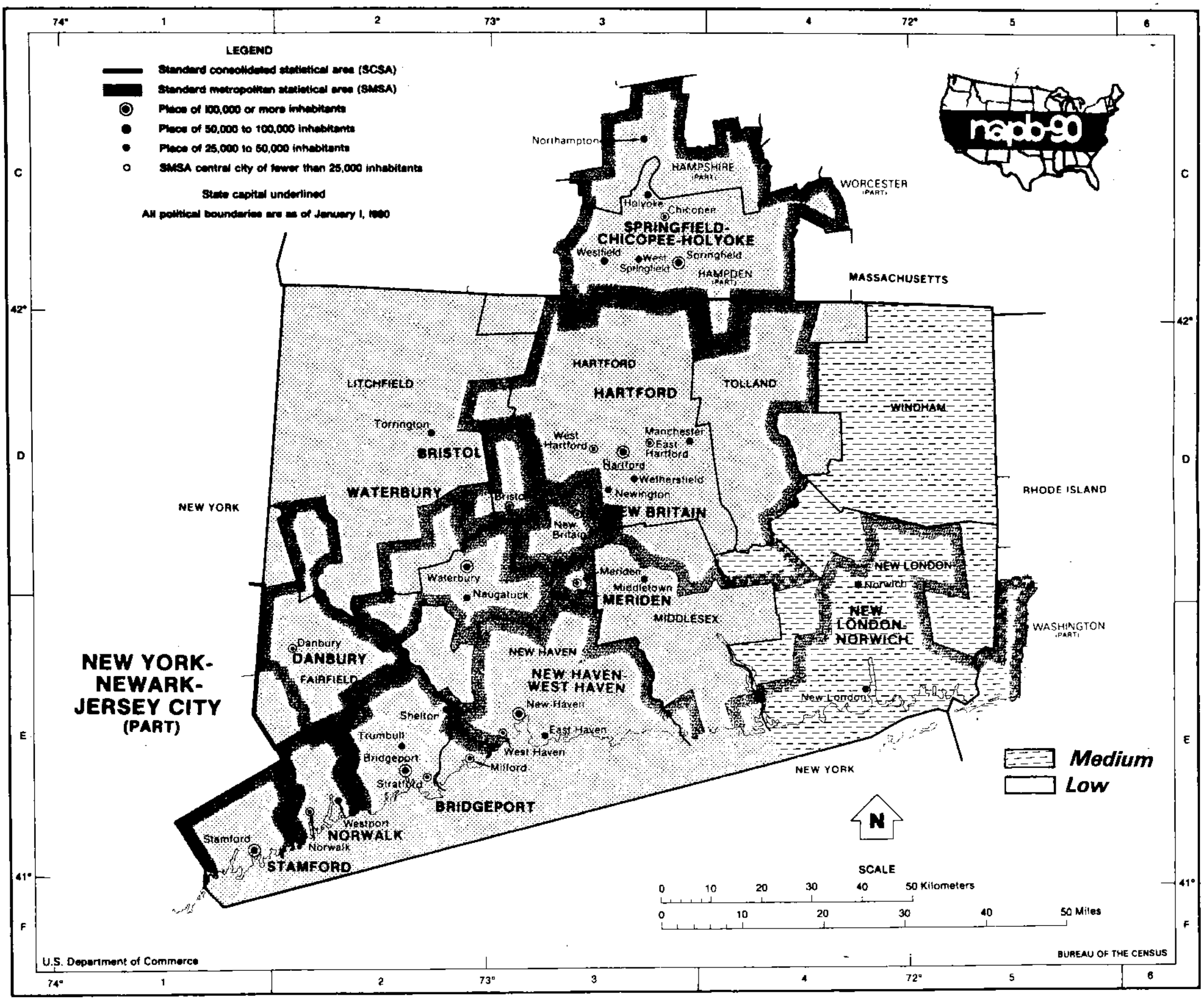
*Interim data; to be corrected

FEMA REGION I -- FALLOUT RISK SUMMARY

Estimated 1985 Population: 12,320,207
Land Area: 61,682 square miles

STATE	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Connecticut	---	---	---	---	341 261	1 184	2 824 200	3 688
Maine	---	---	---	---	88 277	6 721	1 072 601	24 274
Massachusetts	---	---	---	---	655 822	1 514	4 847 653	4 983
New Hampshire	---	---	---	---	---	---	990 437	8 992
Rhode Island	---	---	---	---	578 010	416	387 461	638
Vermont	---	---	---	---	237 450	3 209	297 035	6 063
TOTAL REGION I	---	---	---	---	1 900 820	13 044	10 419 387	48 638

FEMA Region 1 — CONNECTICUT — *Potential Fallout*

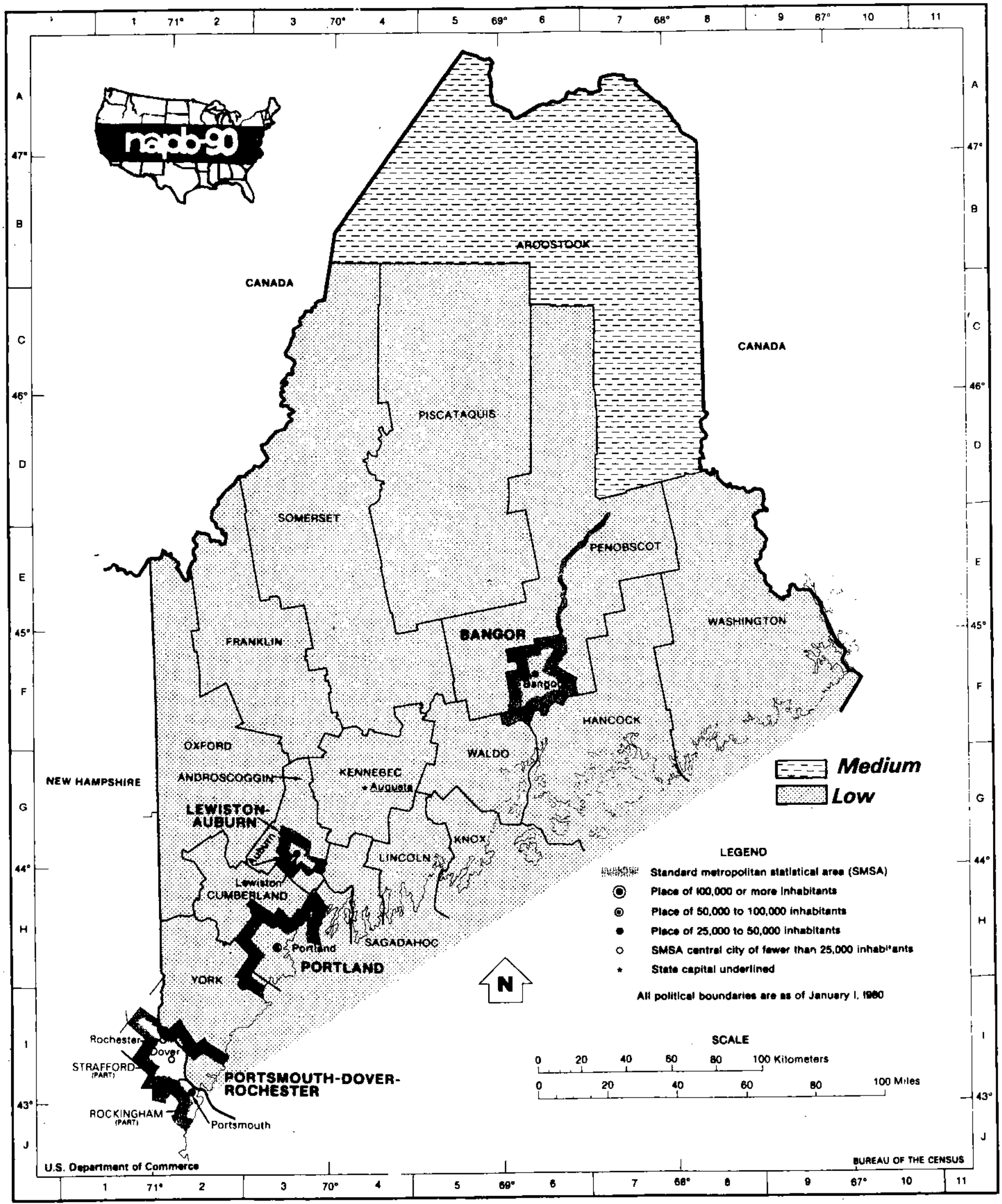


STATE OF CONNECTICUT -- FALLOUT RISK

Estimated 1985 Population: 3,165,461
Land Area: 4,872 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Fairfield							818 293	632
Hartford							819 457	739
Litchfield							160 885	922
Middlesex							133 498	373
New Haven							771 603	610
New London					246 137	669		
Tolland							120 464	412
Windham					95 124	515		
TOTAL STATE	---	---	---	---	341 261	1 184	2 824 200	3 688

FEMA Region 1 — MAINE — *Potential Fallout*

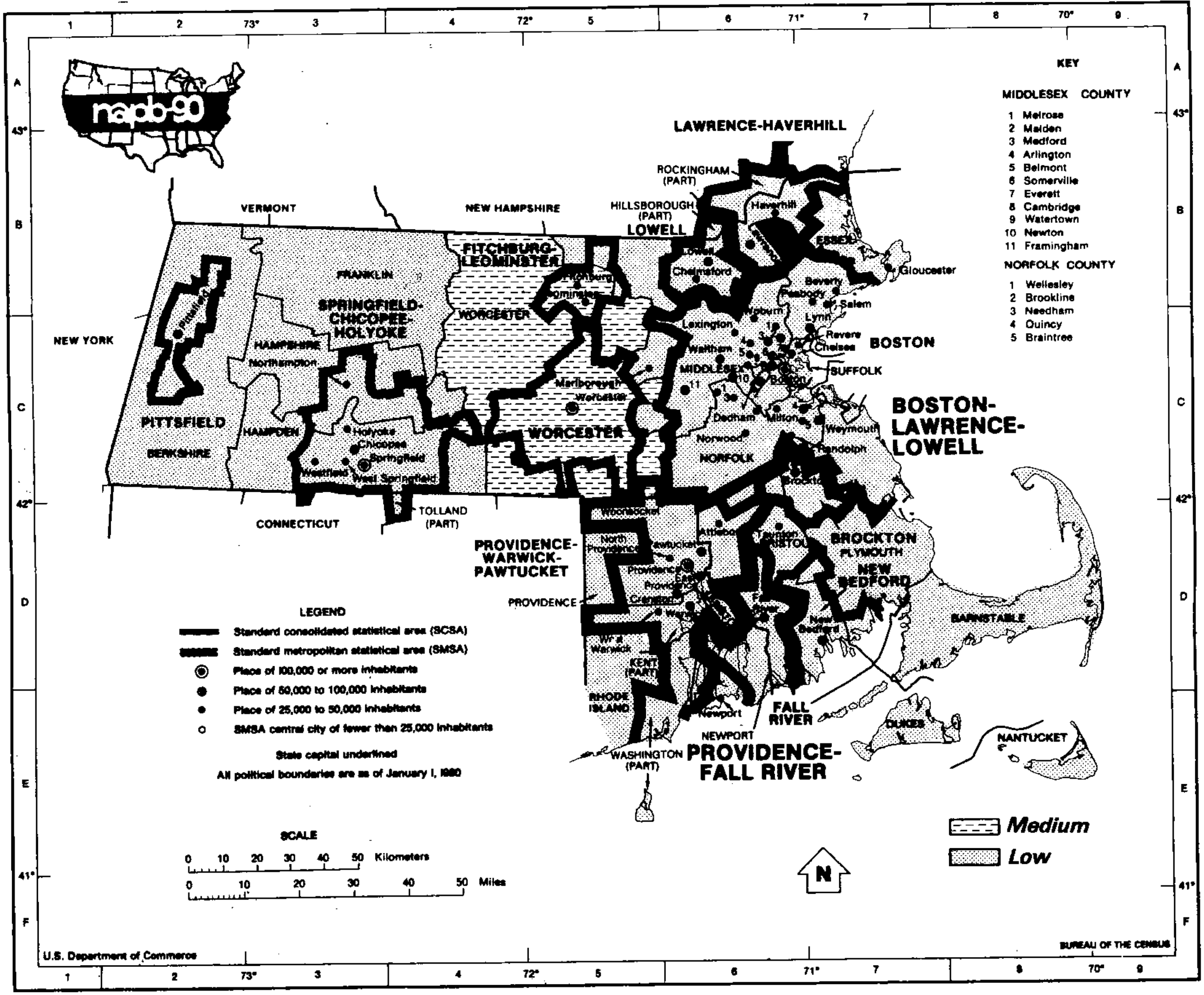


STATE OF MAINE -- FALLOUT RISK

Estimated 1985 Population: 1,160,878
Land Area: 30,995 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Androscoggin							100 112	477
Aroostook					88 277	6 721		
Cumberland							225 058	876
Franklin							29 408	1 699
Hancock							43 805	1 537
Kennebec							112 723	876
Knos							34 496	370
Lincoln							27 958	458
Osford							49 771	2 053
Penobscot							138 771	3 430
Piscataquis							18 065	3 986
Sagadahoc							30 689	257
Somerset							46 806	3 931
Waldo							26 692	730
Washington							33 858	2 586
York							154 389	1 008
STATE TOTAL	---	---	---	---	88 277	6 721	1 072 601	24 274

FEMA Region 1 — MASSACHUSETTS — *Potential Fallout*

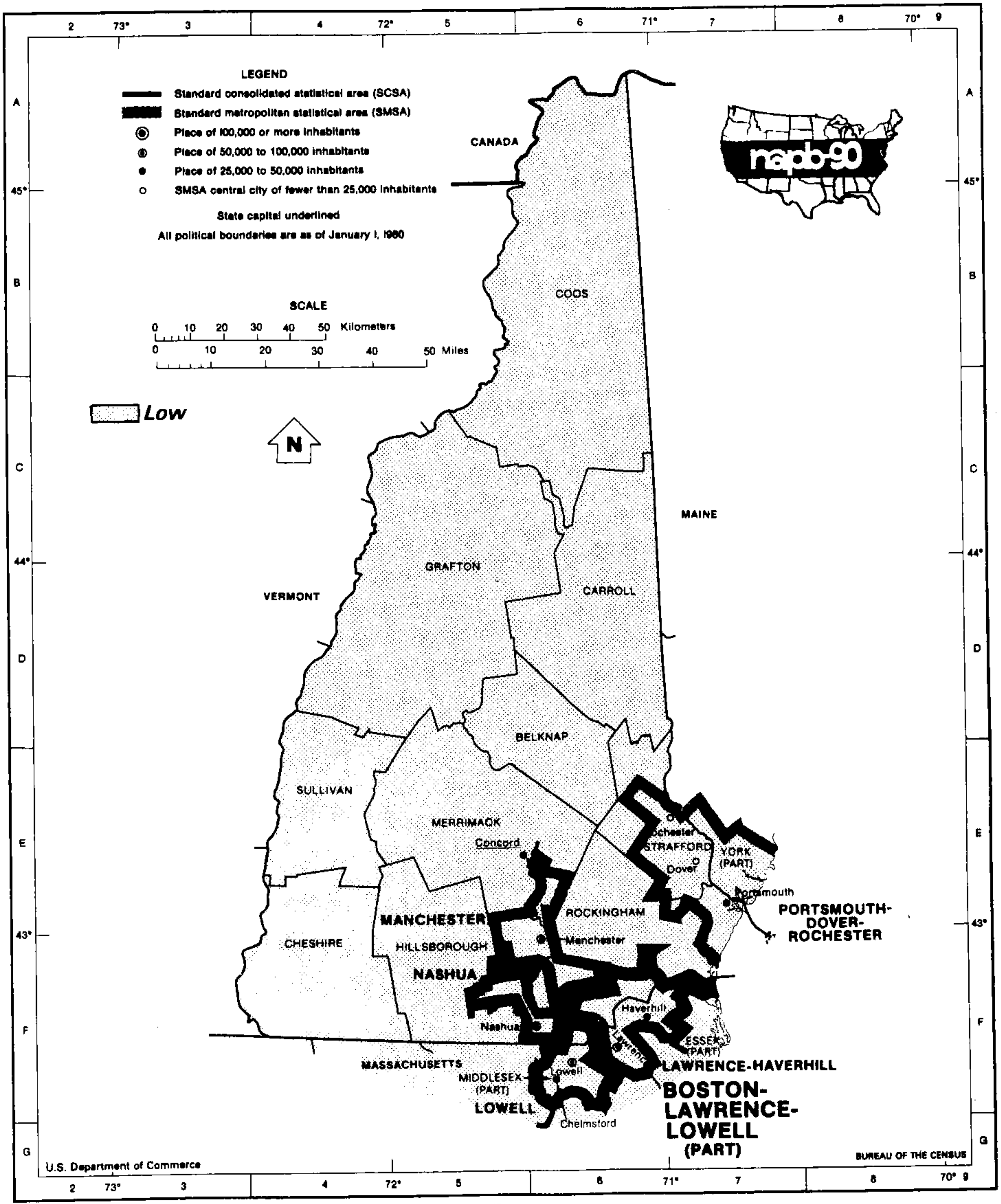


STATE OF MASSACHUSETS -- FALLOUT RISK

Estimated 1985 Population: 5,503,475
Land Area: 6,497 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Bristol							478 662	557
Dukes							10 337	102
Essex							648 793	495
Franklin							64 987	702
Hampden							442 601	618
Hampshire							141 781	528
Middlesex							1 369 905	822
Nantucket							6 070	47
Norfolk							602 837	400
Plymouth							420 708	655
Suffolk							660 972	57
Worcester					655 822	1 514		
TOTAL STATE	---	---	---	---	655 822	1 514	4 847 653	4 983

FEMA Region 1 — NEW HAMPSHIRE — *Potential Fallout*



LEGEND
Standard consolidated statistical area (SCSA)
Standard metropolitan statistical area (SMSA)
Place of 100,000 or more inhabitants
Place of 50,000 to 100,000 inhabitants
Place of 25,000 to 50,000 inhabitants
SMSA central city of fewer than 25,000 inhabitants
State capital underlined
All political boundaries are as of January 1, 1980
SCALE
0 10 20 30 40 50 Kilometers
0 10 20 30 40 50 Miles
Low
N
napb-90
CANADA
MAINE
VERMONT
MASSACHUSETTS
COOS
GRAFTON
CARROLL
BELKNAP
SULLIVAN
MERRIMACK
Concord
STRAFFORD
Rochester
Dover
YORK (PART)
Portsmouth
PORTSMOUTH-DOVER-ROCHESTER
ROCKINGHAM
Manchester
MANCHESTER
HILLSBOROUGH
CHESHIRE
NASHUA
Nashua
Haverhill
Lawrence
ESSEX (PART)
LAWRENCE-HAVERHILL
MIDDLESEX (PART)
Lowell
LOWELL
Chelmsford
BOSTON-LAWRENCE-LOWELL (PART)
U.S. Department of Commerce
BUREAU OF THE CENSUS
73°
72°
71°
70°
45°
44°
43°
A
B
C
D
E
F
G
2
3
4
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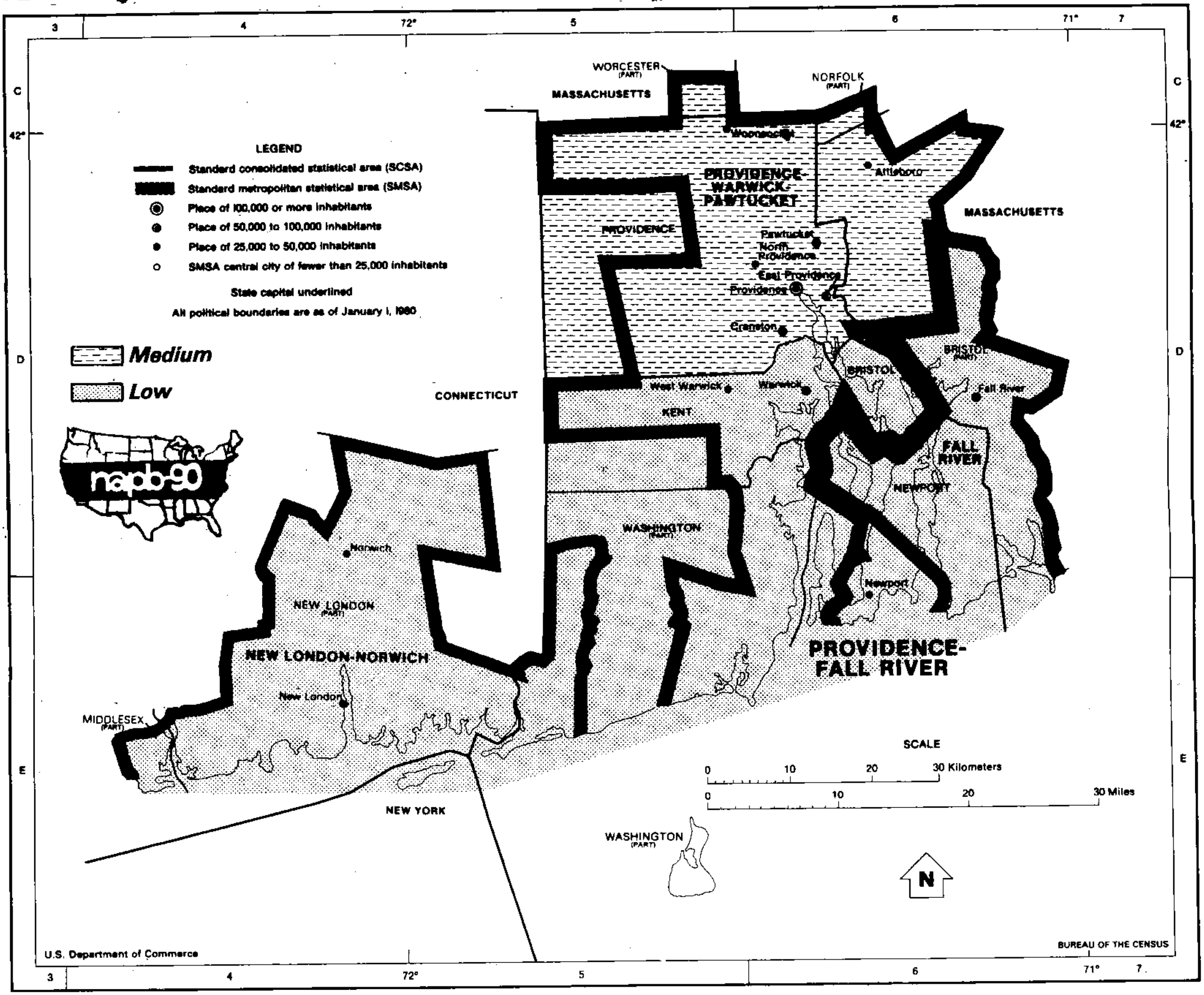
6
7
8
9

STATE OF NEW HAMPSHIRE -- FALLOUT RISK

Estimated 1985 Population: 990,437
Land Area: 8,992 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Belknap							46 034	404
Carroll							30 428	932
Cheshire							64 644	711
Coos							33 352	1 805
Grafton							68 735	1 719
Hillsborough							299 744	876
Merrimack							103 605	936
Rockingham							212 199	699
Strafford							93 819	370
Sullivan							37 877	540
TOTAL STATE	---	---	---	---	---	---	990 437	8 992

FEMA Region 1 — RHODE ISLAND — *Potential Fallout*

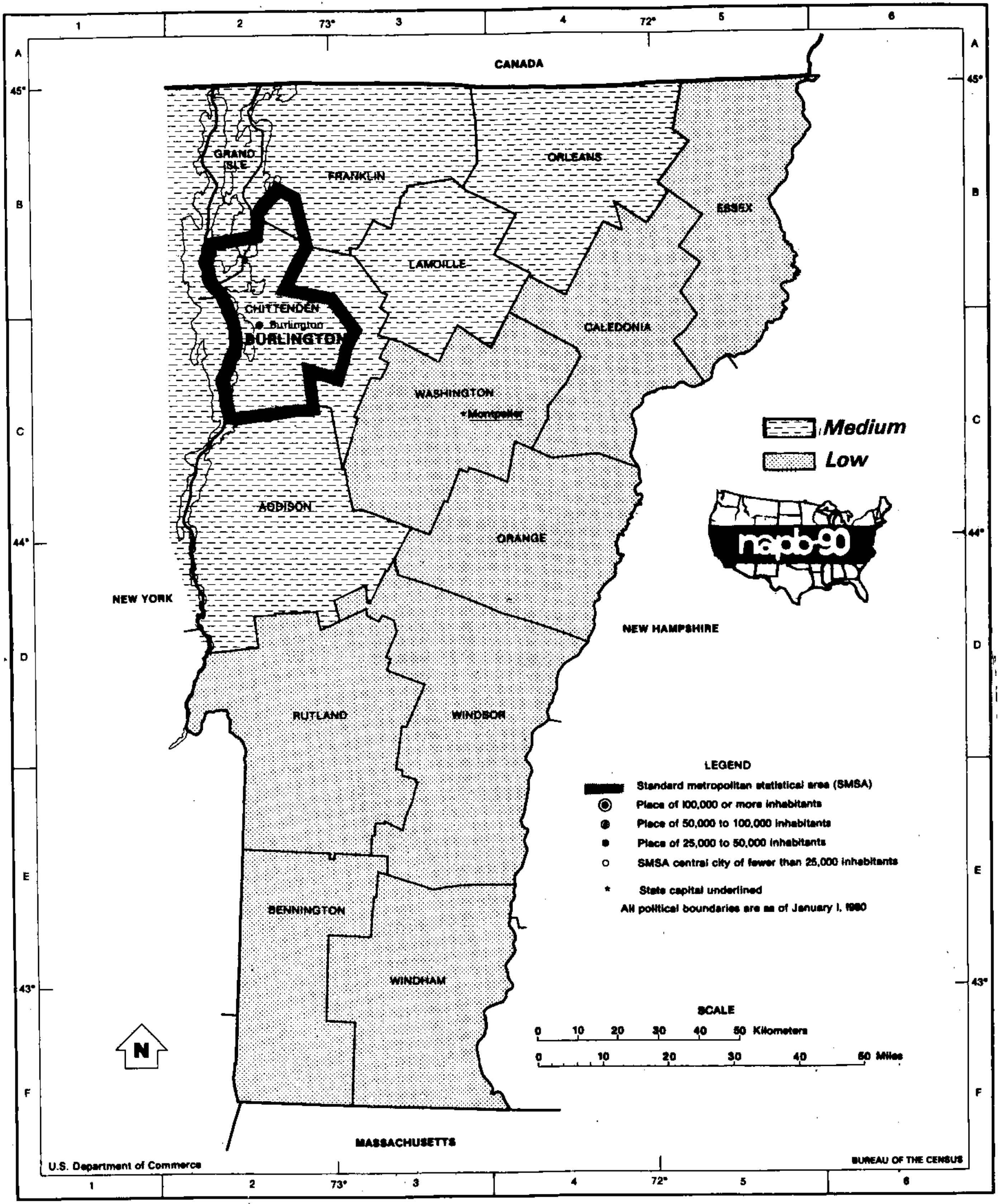


S T A T E   O F   R H O D E   I S L A N D -- F A L L O U T   R I S K

Estimated 1985 Population: 965,471
Land Area: 1,054 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Bristol							46 484	26
Kent							158 247	172
Newport							84 236	107
Providence					578 010	416		
Washington							98 494	333
TOTAL STATE	---	---	---	---	578 010	416	387 461	638

FEMA Region 1 — VERMONT — *Potential Fallout*


CANADA
GRAND ISLE
FRANKLIN
ORLEANS
ESSEX
LAMOILLE
CHITTENDEN
Burlington
BURLINGTON
CALEDONIA
WASHINGTON
*Montpelier
ADDISON
ORANGE
NEW YORK
NEW HAMPSHIRE
RUTLAND
WINDSOR
BENNINGTON
WINDHAM
MASSACHUSETTS
Medium
Low
napb-90
LEGEND
Standard metropolitan statistical area (SMSA)
Place of 100,000 or more inhabitants
Place of 50,000 to 100,000 inhabitants
Place of 25,000 to 50,000 inhabitants
SMSA central city of fewer than 25,000 inhabitants
State capital underlined
All political boundaries are as of January 1, 1980
SCALE
0 10 20 30 40 50 Kilometers
0 10 20 30 40 50 Miles
N
45°
44°
43°
73°
72°
1
2
3
4
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6
A
B
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D
E
F
U.S. Department of Commerce
BUREAU OF THE CENSUS

STATE OF VERMONT -- FALLOUT RISK

Estimated 1985 Population: 534,485
Land Area: 9,272 square miles

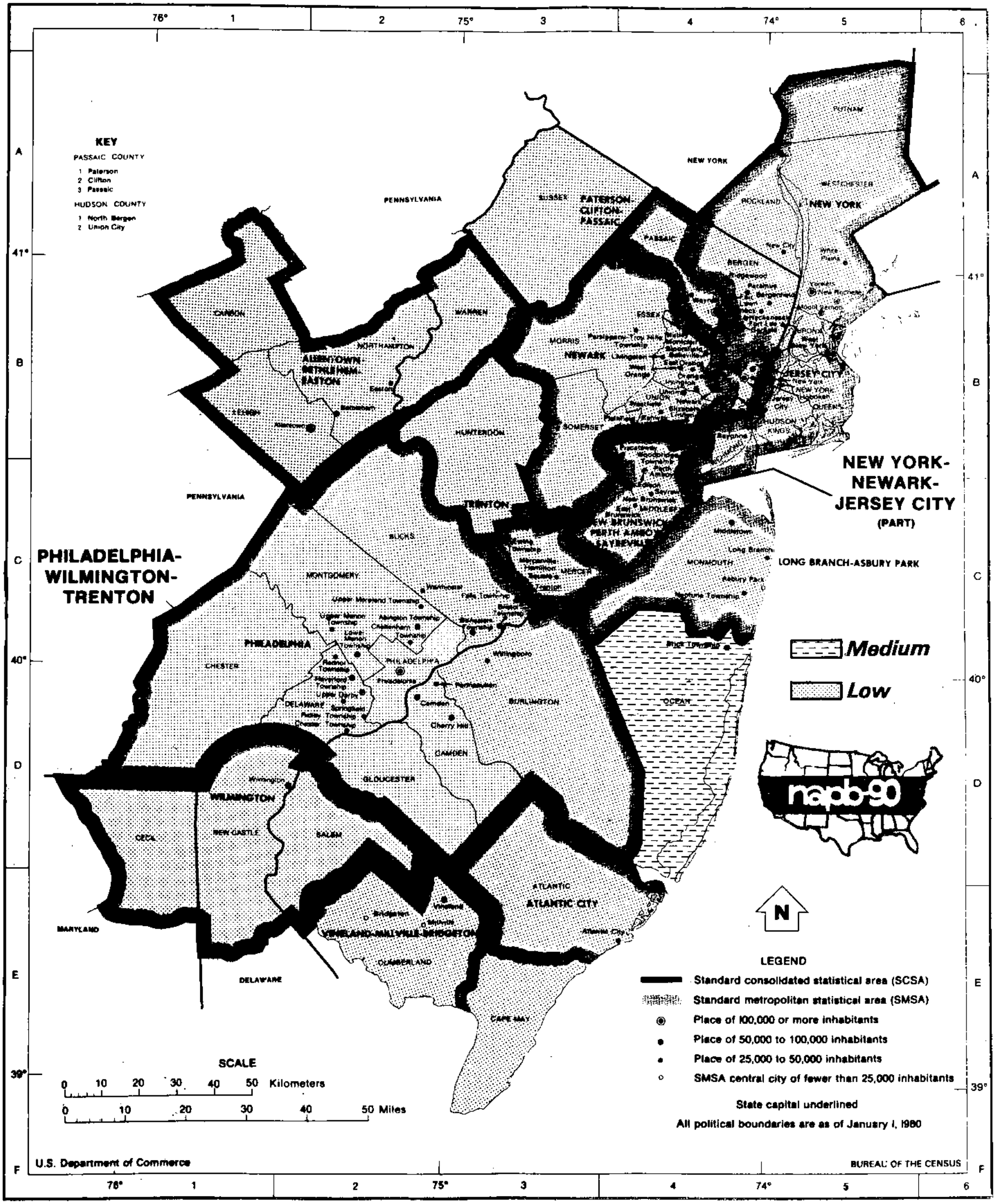
COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	VERY HIGH RISK [GT 15000R] AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	HIGH RISK [EQ/GT 6000R LT 15000R] AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	MEDIUM RISK [EQ/GT 3000R LT 6000R] AREA	LOW RISK [LT 3000R] POPULATION	LOW RISK [LT 3000R] AREA
Addison					31 248	773		
Bennington							34 937	676
Caledonia							26 478	651
Chittenden					123 194	540		
Essex							6 646	666
Franklin					36 337	649		
Grand Isle					5 002	89		
Lamoille					17 676	461		
Orange							24 019	690
Orleans					23 993	697		
Rutland							59 226	932
Washinton							53 831	690
Windham							38 786	786
Windsor							53 112	972
TOTAL STATE	---	---	---	---	237 450	3 209	297 035	6 063

F E M A   R E G I O N   I I -- F A L L O U T   R I S K   S U M M A R Y

Estimated 1985 Population: 28,626,118
Land Area: 58,436 square miles

STATE	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/LT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/LT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
New Jersey	....				382 488	641	7 168 673	6 827
New York	....				709 012	9 757	17 065 131	37 620
Puerto Rico	....						3 196 520	3 459
Virgin Islands	....						104 294	132
TOTAL REGION II	---	---	---	---	1 091 500	10 398	27 534 618	48 038

FEMA Region 2 — NEW JERSEY — *Potential Fallout*

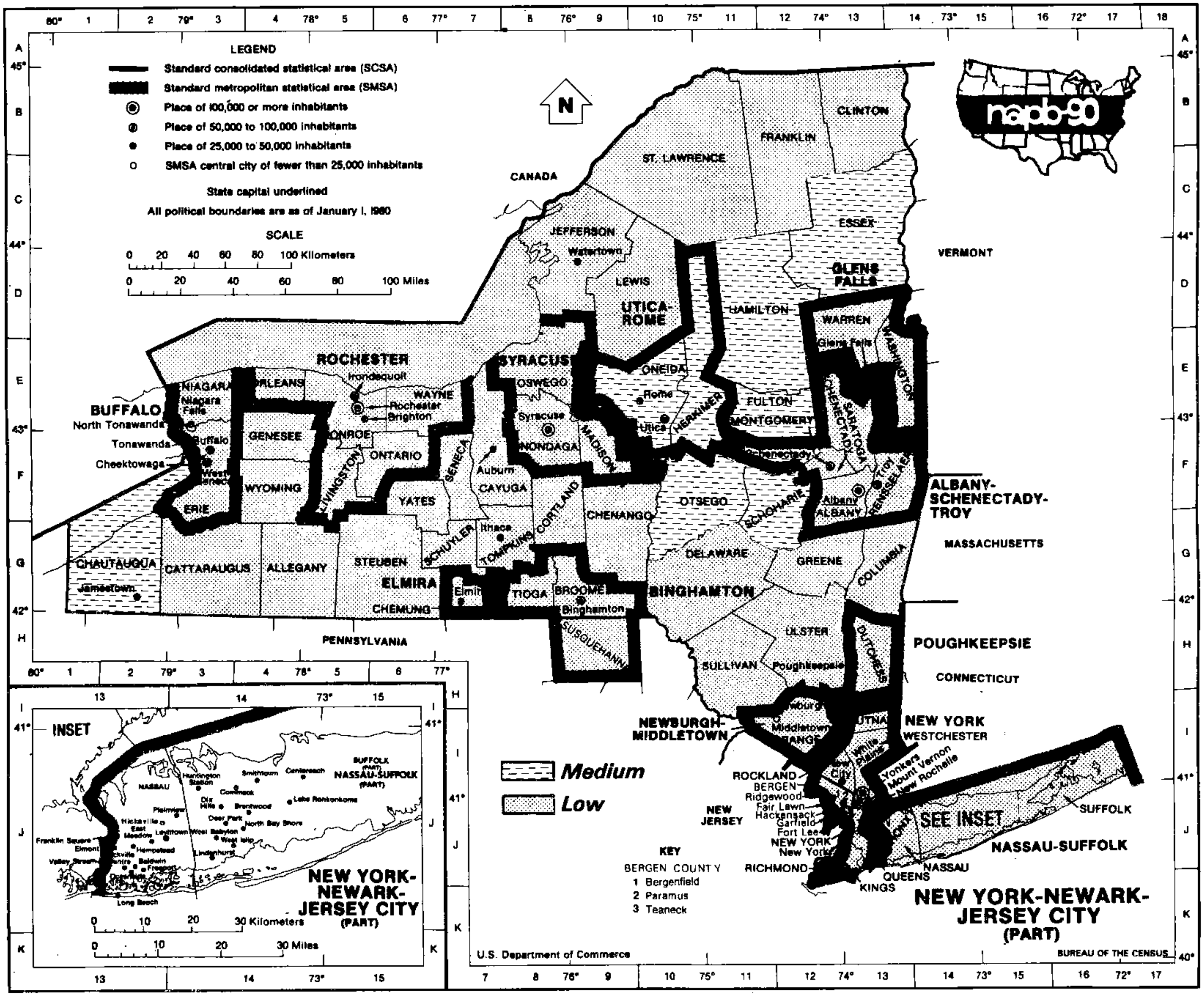


STATE OF NEW JERSEY -- FALLOUT RISK

Estimated 1985 Population: 7,551,161
Land Area: 7,468 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Atlantic							202 977	568
Bergen							843 976	237
Burlington							382 675	808
Camden							484 532	223
Cape May							90 810	263
Cumberland							133 582	498
Essex							826 857	127
Gloucester							209 076	327
Hudson							560 606	46
Hunterdon							93 887	427
Mercer							315 518	227
Middlesex							623 943	316
Monmouth							530 780	472
Morris							420 366	471
Ocean					382 488	641		
Passaic							457 120	187
Salem							66 592	338
Somerset							212 791	305
Sussex							121 242	525
Union							505 786	103
Warren							85 557	359
STATE TOTAL	---	---	---	---	382 488	641	7 168 673	6 827

FEMA Region 2 — NEW YORK — *Potential Fallout*


LEGEND
Standard consolidated statistical area (SCSA)
Standard metropolitan statistical area (SMSA)
Place of 100,000 or more inhabitants
Place of 50,000 to 100,000 inhabitants
Place of 25,000 to 50,000 inhabitants
SMSA central city of fewer than 25,000 inhabitants
State capital underlined
All political boundaries are as of January 1, 1980
SCALE
0 20 40 60 80 100 Kilometers
0 20 40 60 80 100 Miles
N
Medium
Low
CANADA
VERMONT
MASSACHUSETTS
CONNECTICUT
PENNSYLVANIA
NEW JERSEY
BUFFALO
ROCHESTER
SYRACUSE
UTICA-ROME
GLENS FALLS
ALBANY-SCHENECTADY-TROY
BINGHAMTON
ELMIRA
POUGHKEEPSIE
NEWBURGH-MIDDLETOWN
NEW YORK
NASSAU-SUFFOLK
NEW YORK-NEWARK-JERSEY CITY (PART)
SEE INSET
KEY
BERGEN COUNTY
1 Bergenfield
2 Paramus
3 Teaneck
INSET
NEW YORK-NEWARK-JERSEY CITY (PART)
0 10 20 30 Kilometers
0 10 20 30 Miles
U.S. Department of Commerce
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STATE OF NEW YORK -- FALLOUT RISK

Estimated 1985 Population: 17,774,143
Land Area: 47,377 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 3000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Albany							285 433	524
Allegany							51 343	1 032
Bronx							1 173 939	42
Broome							213 451	712
Cattaraugus							86 102	1 306
Cayuga							80 381	695
Chautauqua					146 038	1 064		
Chemung							92 406	411
Chenango							50 447	897
Clinton							80 924	1 043
Columbia							61 646	638
Cortland							47 988	500
Delaware							46 664	1 440
Dutchess							255 073	804
Erie							977 687	1 046
Essex					36 733	1 807		
Franklin							43 604	1 642
Fulton					56 407	497		
Genesee							56 691	495
Greene							41 477	648
Hamilton					4 806	1 721		
Herkimer					67 691	1 417		
Jefferson							89 068	1 273
Kings							2 259 554	70
Lewis							24 945	1 283

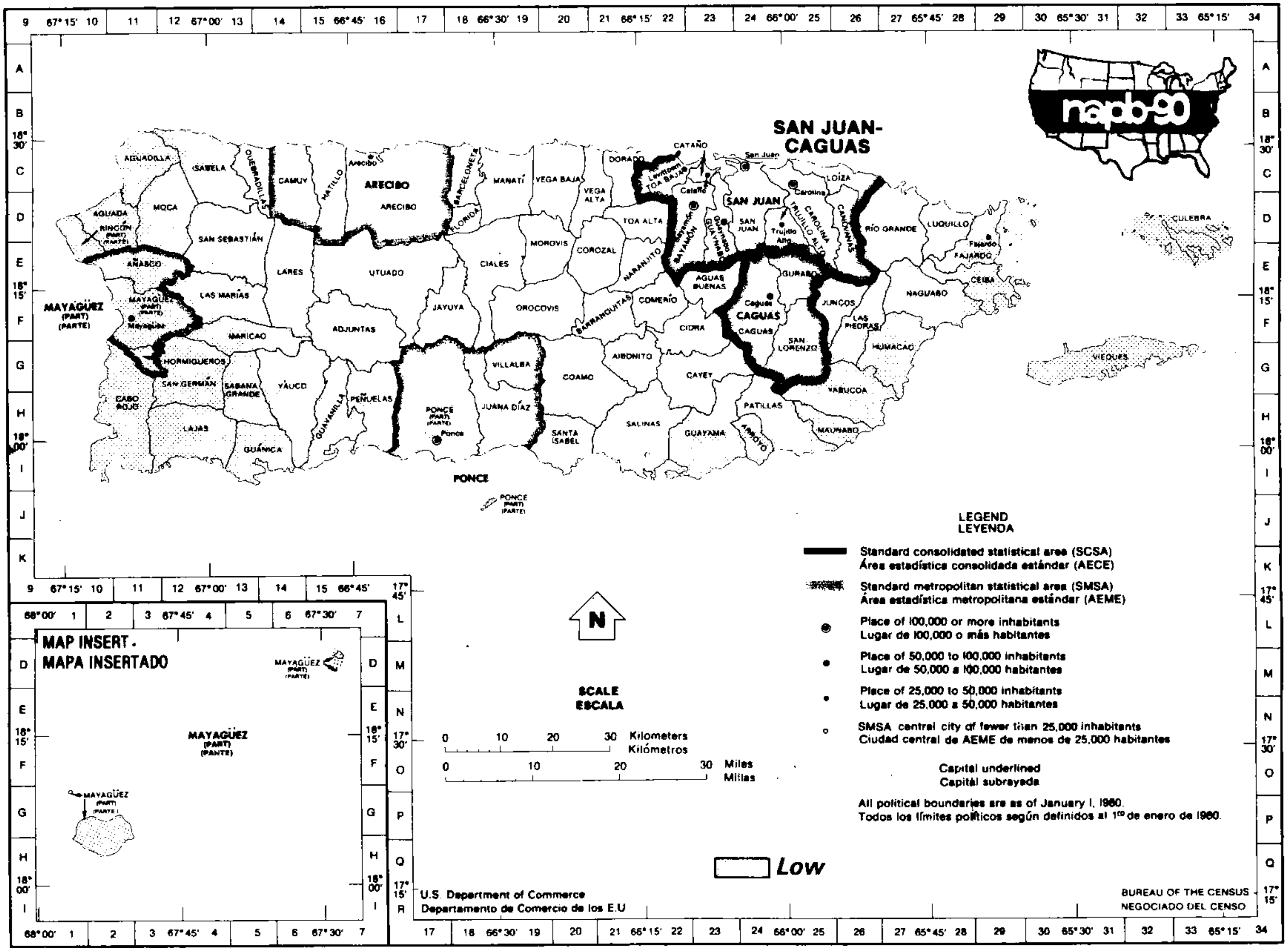
STATE OF NEW YORK (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Livingston							58 866	633
Madison							67 406	656
Monroe							713 316	663
Montgomery					53 004	404		
Nassau							1 342 306	287
New York							1 463 052	22
Niagara							217 492	526
Oneida					253 963	1 219		
Onondaga							464 441	785
Ontario							92 890	644
Orange							276 972	826
Orleans							39 425	391
Oswego							120 383	954
Otsego					59 978	1 004		
Putnam							81 774	231
Queens							1 916 194	108
Rensselaer							152 266	655
Richmond							375 223	59
Rockland							265 505	175
St Lawrence							113 496	2 728
Saratoga							161 216	810
Schenectady							151 139	206
Schoharie					30 392	624		
Schuyler							17 721	329
Seneca							32 754	327

STATE OF NEW YORK (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Steuben							99 365	1 396
Suffolk							1 322 809	912
Sullivan							67 719	976
Tioga							50 776	519
Tompkins							88 051	477
Ulster							163 741	1 131
Warren							55 645	882
Washington							56 349	836
Wayne							88 815	603
Westchester							866 945	438
Wyoming							40 761	595
Yates							21 495	339
TOTAL STATE	---	---	---	---	709 012	9 757	17 065 131	37 620

FEMA Region 2 — PUERTO RICO — *Potential Fallout*



TERRITORY OF PUERTO RICO -- FALLOUT RISK

Estimated 1985 Population: 3,196,520
Land Area: 3,459 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
All Counties							3 196 520	3 459
TOTAL TERRITORY	---	---	---	---	---	---	3 196 520	3 459

[MAP WILL BE FURNISHED SEPARATELY]

REGION II - TERRITORY OF THE VIRGIN ISLANDS - Potential Fallout

TERRITORY OF THE VIRGIN ISLANDS -- FALLOUT RISK

Estimated 1985 Population: 104,294
Land Area: 132 square miles

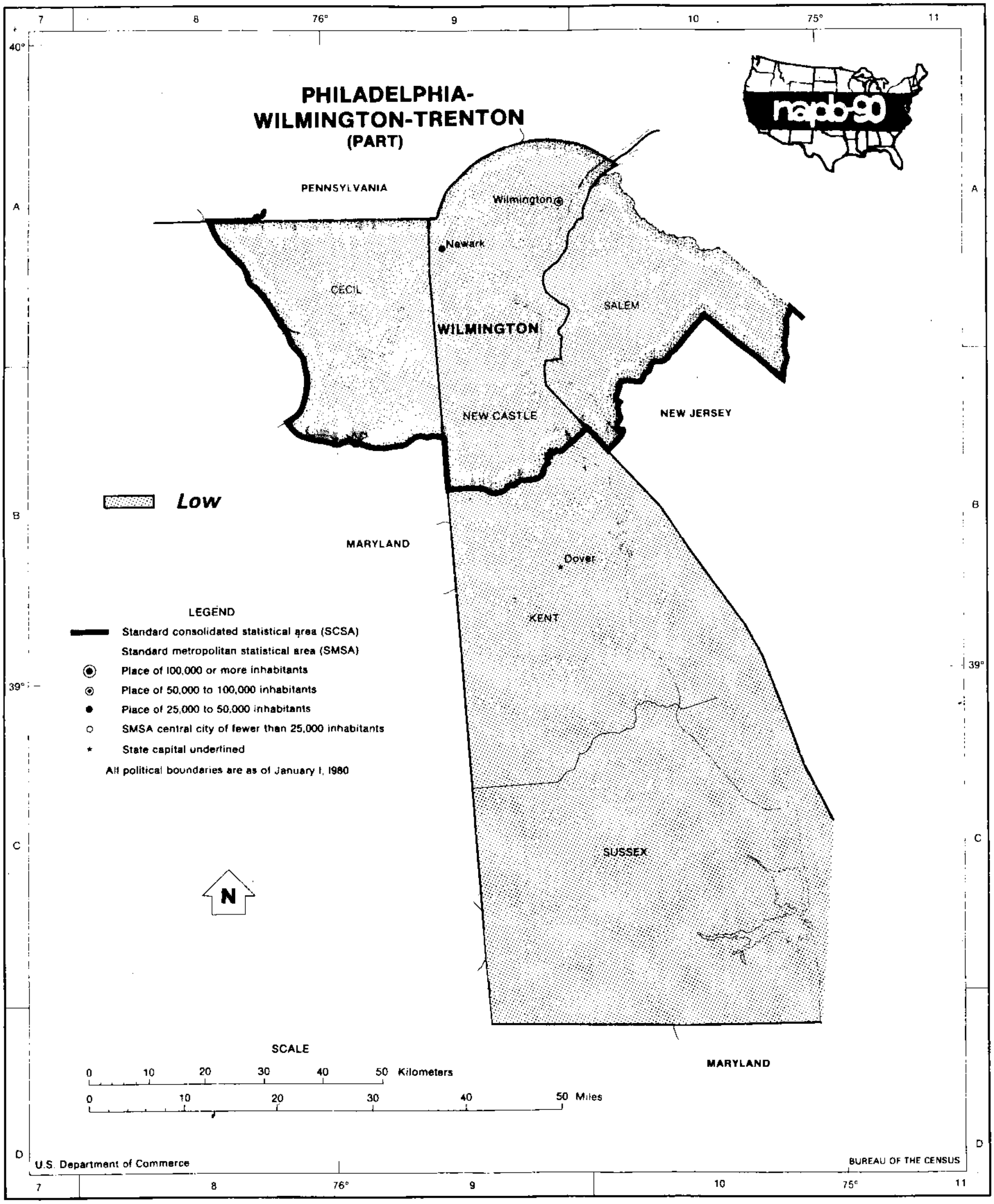
COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
All Counties	....						104 294	132
TOTAL TERRITORY	---	---	---	---	---	---	104 294	132

FEMA REGION III -- FALLOUT RISK SUMMARY

Estimated 1985 Population: 25,107,876
Land Area: 120,550 square miles

	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
STATE	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Delaware	---	---	---	---	---	---	530 229	1 933
Dist.of Columbia	---	---	---	---	---	---	618 906	63
Maryland	---	---	---	---	---	---	4 381 743	9 838
Pennsylvania	---	---	---	---	498 309	2 487	11 410 774	42 405
Virginia	---	---	---	---	---	---	5 715 659	39 700
West Virginia	---	---	---	---	---	---	1 952 256	24 124
TOTAL REGION III	---	---	---	---	489 309	2 487	24 609 567	118 063

FEMA Region 3 — DELAWARE — *Potential Fallout*



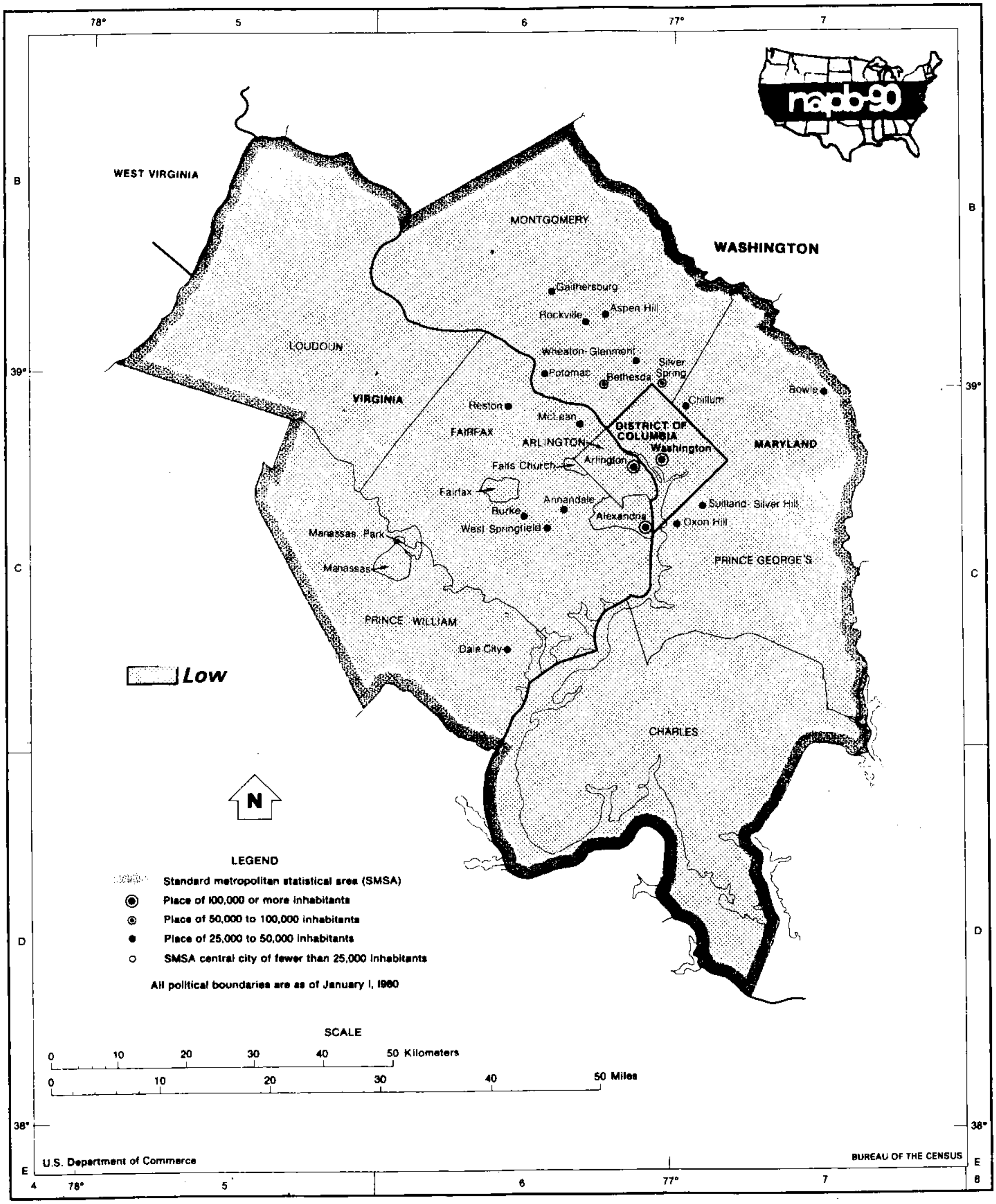
PHILADELPHIA-WILMINGTON-TRENTON (PART)
PENNSYLVANIA
Wilmington
Newark
CECIL
WILMINGTON
NEW CASTLE
SALEM
NEW JERSEY
Low
MARYLAND
Dover
KENT
SUSSEX
MARYLAND
LEGEND
Standard consolidated statistical area (SCSA)
Standard metropolitan statistical area (SMSA)
Place of 100,000 or more inhabitants
Place of 50,000 to 100,000 inhabitants
Place of 25,000 to 50,000 inhabitants
SMSA central city of fewer than 25,000 inhabitants
State capital underlined
All political boundaries are as of January 1, 1980
N
SCALE
0 10 20 30 40 50 Kilometers
0 10 20 30 40 50 Miles
napb-90
U.S. Department of Commerce
BUREAU OF THE CENSUS
7 8 76° 9 10 75° 11
40° 39°
A B C D

STATE OF DELAWARE -- FALLOUT RISK

Estimated 1985 Population: 530,229
Land Area: 1,933 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Kent							15 037	595
New Castle							409 985	396
Sussex							105 207	942
TOTAL STATE	---	---	---	---	---	---	530 229	1 933

FEMA Region 3 — DISTRICT OF COLUMBIA — *Potential Fallout*

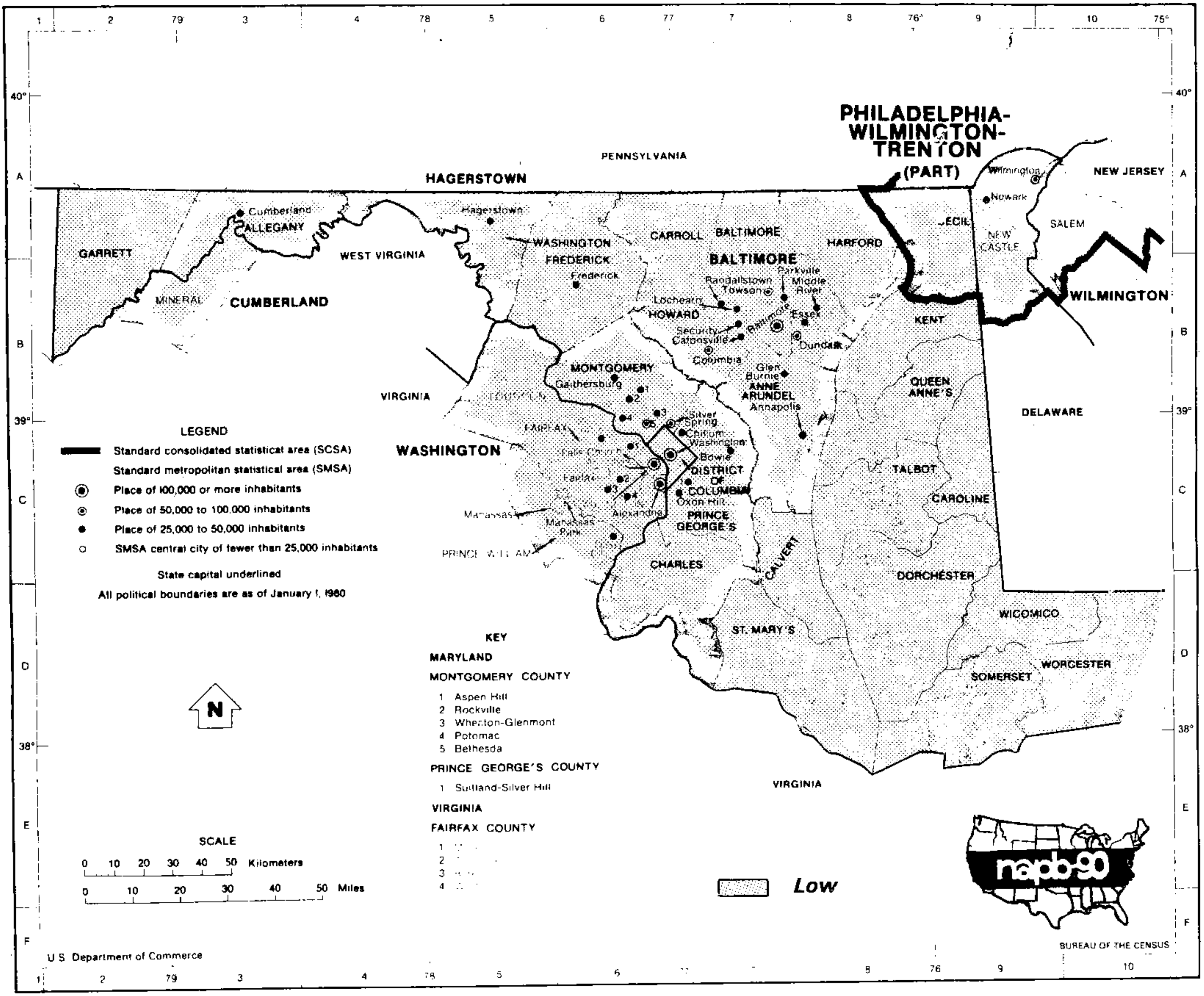


DISTRICT OF COLUMBIA -- FALLOUT RISK

Estimated 1985 Population: 618,906
Land Area: 63 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	VERY HIGH RISK [GT 15000R] AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	HIGH RISK [EQ/GT 6000R LT 15000R] AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	MEDIUM RISK [EQ/GT 3000R LT 6000R] AREA	LOW RISK [LT 3000R] POPULATION	LOW RISK [LT 3000R] AREA
Dist. of Columbia							618 906	63
TOTAL DISTRICT	---	---	---	---	---	---	618 906	63

FEMA Region 3 — MARYLAND — Potential Fallout

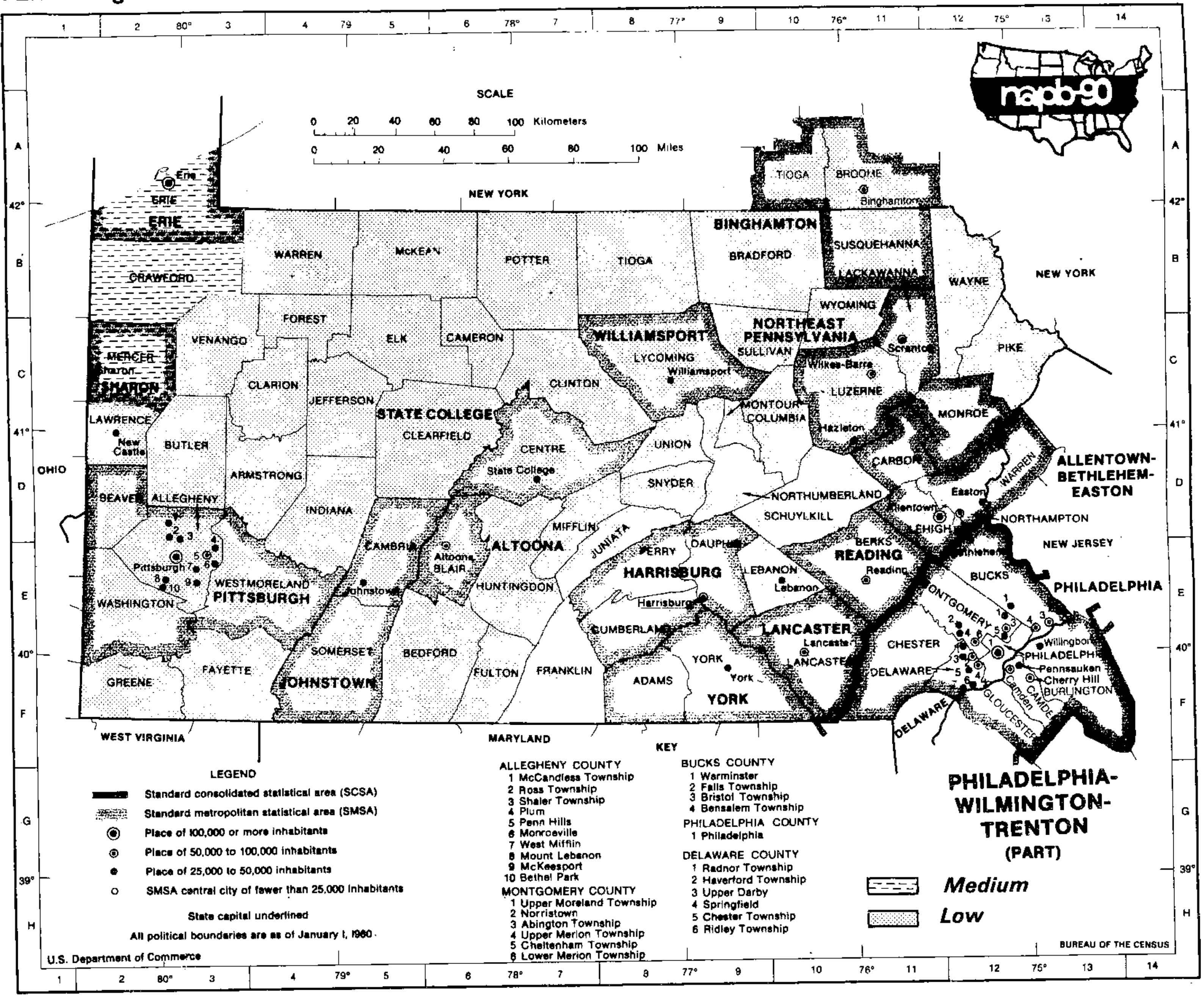


STATE OF MARYLAND -- FALLOUT RISK

Estimated 1985 Population: 4,381,743
Land Area: 9,838 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Allegany							76 002	421
Anne Arundel							393 425	419
Baltimore							677 372	598
Calvert							40 418	213
Caroline							23 715	321
Carroll							106 853	452
Cecil							66 776	359
Charles							84 030	452
Dorchester							29 717	593
Frederick							126 295	663
Garrett							26 913	657
Harford							152 156	447
Howard							139 967	251
Kent							16 679	278
Montgomery							635 241	495
Prince Georges							678 149	487
Queen Annes							28 229	372
St Marys							64 355	373
Somerset							18 515	339
Talbot							27 117	259
Washington							111 651	455
Wicomico							66 361	379
Worcester							34 039	475
Baltimore City							757 768	80
TOTAL STATE	---	---	---	---	---	---	4 381 743	9 838

FEMA Region 3 — PENNSYLVANIA — *Potential Fallout*



STATE OF PENNSYLVANIA -- FALLOUT RISK

Estimated 1985 Population: 11,909,083
Land Area: 44,892 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Adams							68 459	521
Allegheny							1 399 652	727
Armstrong							83 324	646
Beaver							197 808	436
Bedford							48 356	1 017
Berks							318 305	861
Blair							133 813	527
Bradford							64 199	1 152
Bucks							515 874	610
Butler							152 040	789
Cambria							175 533	691
Cameron							6 596	398
Carbon							54 170	385
Centre							114 856	1 106
Chester							339 008	758
Clarion							42 996	607
Clearfield							84 733	1 149
Clinton							39 156	892
Columbia							61 778	486
Crawford					89 061	1 011		
Cumberland							186 988	547
Dauphin							236 650	528
Delaware							550 418	184
Elk							37 425	830
Erie					282 674	804		

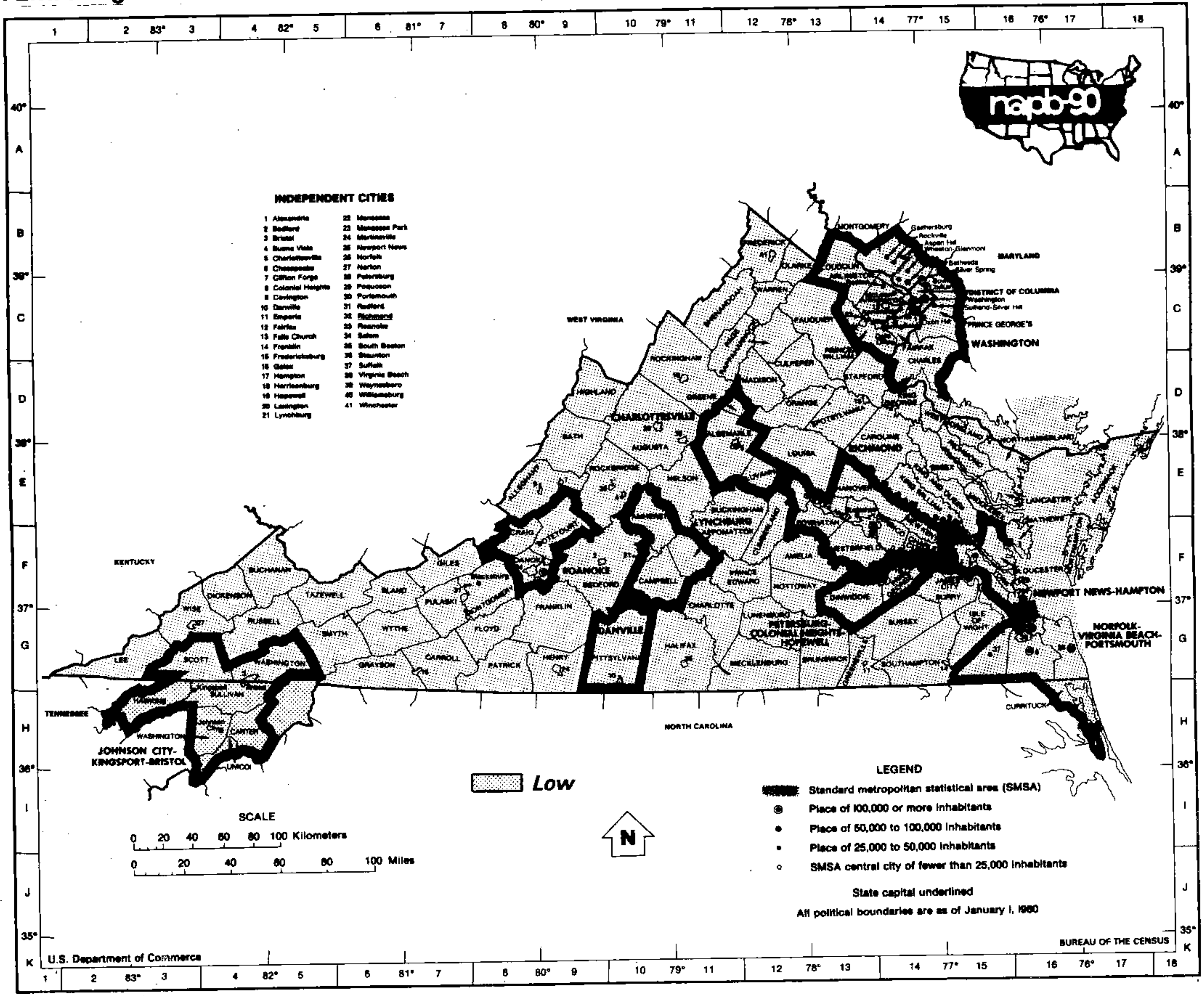
STATE OF PENNSYLVANIA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Fayette							159 070	794
Forest							5 018	428
Franklin							116 866	774
Fulton							13 721	437
Greene							41 362	577
Huntingdon							42 811	877
Indiana							93 550	829
Jefferson							49 051	656
Juniata							19 980	392
Lackawanna							222 969	461
Lancaster							386 020	952
Lawrence							105 403	363
Lebanon							111 919	363
Lehigh							277 519	348
Luzerne							334 652	891
Lycoming							116 783	1 237
McKean							48 882	979
Mercer					126 574	672		
Mifflin							46 580	413
Monroe							79 149	609
Montogmery							662 853	486
Montour							17 066	131
Northampton							232 130	376
Northumberland							100 144	461
Perry							38 081	557
Philadelphia							1 636 321	136
Pike							21 143	551
Potter							18 490	1 081
Schuylkill							158 879	781
Snyder							35 824	329

STATE OF PENNSYLVANIA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Somerset							82 007	1 073
Sullivan							6 159	451
Susquehanna							39 233	826
Tioga							40 093	1 131
Union							33 796	317
Venango							64 445	679
Warren							47 707	885
Washington							217 162	858
Wayne							38 414	731
Westmoreland							385 141	1 033
Wyoming							27 557	399
York							324 687	906
TOTAL STATE	---	---	---	---	498 309	2 487	11 410 774	42 405

FEMA Region 3 — VIRGINIA — *Potential Fallout*



STATE OF VIRGINIA -- FALLOUT RISK

Estimated 1985 Population: 5,715,659
Land Area: 39,700 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Accomack							30 877	476
Albemarle							59 605	725
Alleghany							13 541	446
Amelia							8 247	357
Amherst							29 207	478
Appomattox							12 380	336
Arlington							154 597	26
Augusta							54 869	989
Bath							5 302	537
Bedford							37 379	747
Bland							6 584	359
Botetourt							23 987	545
Brunswick							16 369	563
Buchanan							37 878	504
Buckingham							11 972	583
Campbell							46 194	505
Caroline							18 878	536
Carroll							28 517	478
Charles City							6 751	181
Charlotte							11 840	476
Chesterfield							164 500	434
Clarke							10 212	178
Craig							4 029	330
Culpeper							23 367	382
Cumberland							7 883	300

STATE OF VIRGINIA (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
Dickenson							20 223	331
Dinwiddie							21 091	507
Essex							8 754	263
Fairfax							692 187	393
Fauquier							40 110	651
Floyd							11 749	381
Fluvanna							10 519	290
Franklin							37 107	683
Frederick							35 630	415
Giles							17 799	362
Gloucester							25 841	225
Goochland							12 676	281
Grayson							16 832	446
Greene							8 522	157
Greensville							10 082	300
Halifax							29 663	816
Hanover							52 693	468
Henrico							195 226	238
Henry							56 311	382
Highland							2 797	416
Isle of Wight							23 553	319
James City							25 364	153
King & Queeen							5 897	317
King George							11 204	180
King William							9 888	278
Lancaster							10 760	133
Lee							27 010	437
Loudoun							63 985	521
Louisa							18 918	497
Lunenburg							12 155	432

STATE OF VIRGINIA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Madison							10 609	322
Mathews							8 623	87
Mecklenburg							27 798	616
Middlesex							8 286	134
Montgomery							65 379	390
Nelson							12 336	475
New Kent							10 111	213
Northhamptom							14 097	226
Northumberland							9 918	185
Nottoway							14 182	317
Orange							19 053	342
Page							19 593	313
Patrick							17 739	481
Pittsylvania							66 604	995
Powhatan							13 752	261
Prince Edward							16 928	354
Prince George							26 007	266
Prince William							169 165	339
Pulaski							34 978	318
Rappahannock							6 117	267
Richmond							6 816	193
Roanoke							74 101	251
Rockbridge							18 123	603
Rockingham							53 179	865
Russell							33 140	479
Scott							25 669	536
Shenandoah							28 403	512
Smyth							33 437	452
Southampton							19 089	603
Spotsylvania							36 716	404

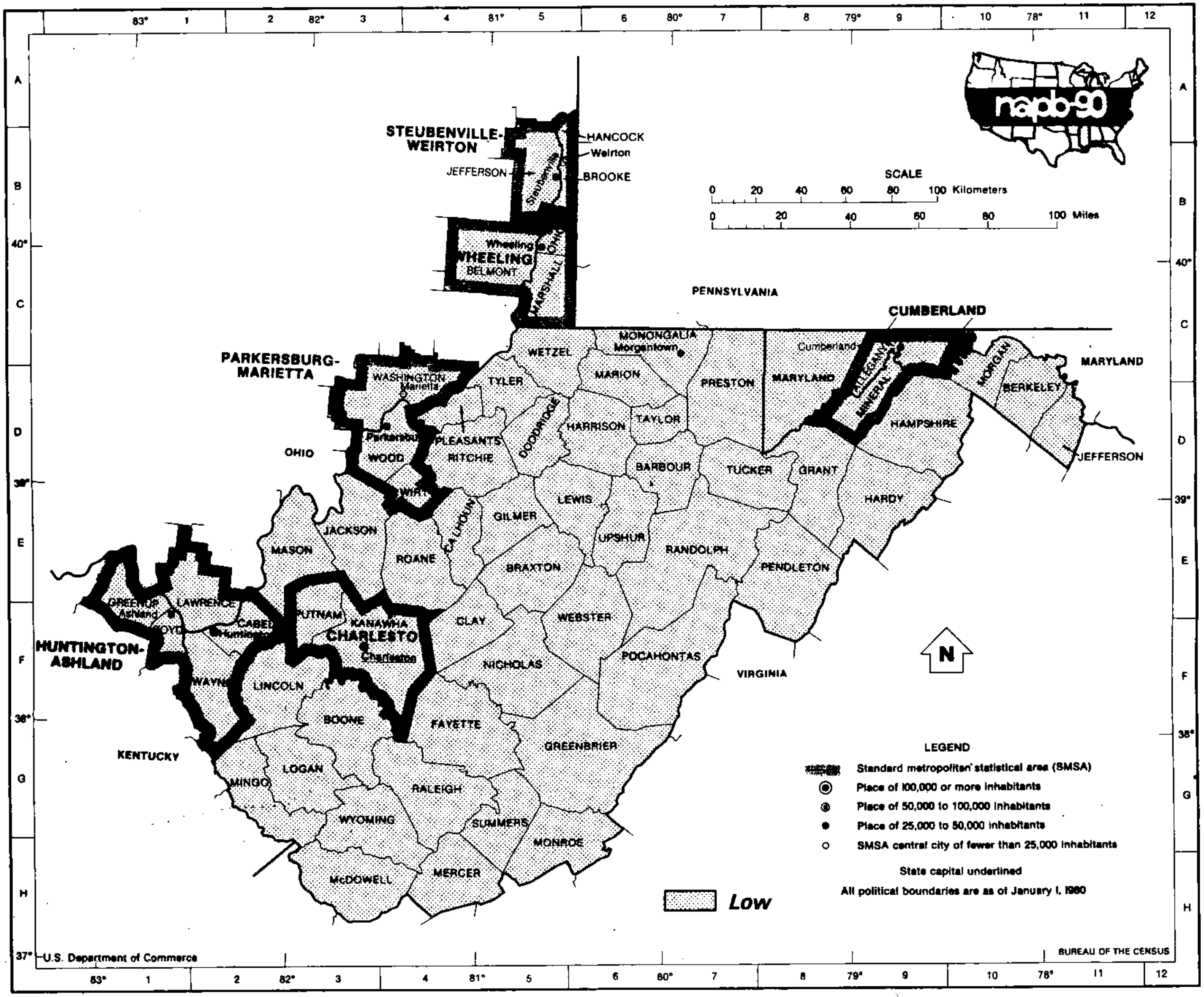
STATE OF VIRGINIA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Stafford							48 799	271
Surry							6 288	281
Sussex							10 226	492
Tazewell							51 785	520
Warren							22 363	217
Washington							47 631	563
Westmoreland							14 279	227
Wise							45 748	405
Wythe							25 624	464
York							40 171	113
INDEPENDENT CITIES								
Alexandria							107 977	15
Bedford							6 277	7
Bristol							18 401	12
Buena Vista							6 414	3
Charlottesville							40 757	10
Chesapeake							128 906	340
Clifton Forge							4 803	3
Colonial Heights							17 613	8
Covington							7 492	4
Danville							44 426	17
Emporia							4 822	2
Fairfax							20 471	6
Falls Church							9 547	2
Franklin							7 175	4
Fredericksburg							19 356	6
Galax							6 507	8
Hampton							126 828	51
Harrisonburg							26 543	6
Hopewell							24 495	10
Lexington							6 774	2

STATE OF VIRGINIA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Lynchburg							67 430	49
Manassas							25 643	8
Manassas Park							6 524	2
Martinsville							18 264	11
Newport News							159 965	65
Norfolk							282 850	53
Norton							4 446	7
Petersburg							40 714	23
Poquoson							10 073	17
Portsmouth							108 802	30
Radford							13 415	7
Richmond							219 010	60
Roanoke							100 799	43
Salem							24 293	14
South Boston							7 353	5
Staunton							21 871	8
Suffolk							49 070	409
Virginia Beach							320 264	256
Waynesboro							15 194	8
Williamsburg							11 161	5
Winchester							20 561	9
TOTAL STATE	---	---	---	---	---	---	5 715 659	39 700

FEMA Region 3 — WEST VIRGINIA — Potential Fallout



STATE OF WEST VIRGINIA -- FALLOUT RISK

Estimated 1985 Population: 1,952,256
Land Area: 24,124 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Barbour							16 575	343
Berkeley							50 737	322
Boone							30 926	503
Braxton							14 867	513
Brooke							29 855	90
Cabell							105 480	282
Calhoun							8 754	280
Clay							11 636	346
Dodridge							7 728	321
Fayette							56 777	667
Gilmer							8 570	340
Grant							10 700	480
Greenbrier							36 418	1 025
Hampshire							16 044	644
Hancock							39 360	85
Hardy							10 750	585
Harrison							77 827	417
Jackson							26 271	464
Jefferson							32 646	209
Kanawha							225 530	901
Lewis							18 828	389
Lincoln							23 898	439
Logan							51 109	456
McDowell							46 772	535
Marion							64 570	312

STATE OF WEST VIRGINIA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Marshall							40 688	305
Mason							26 520	433
Mercer							74 229	420
Mineral							27 657	329
Mingo							38 728	424
Monongalia							78 079	363
Monroe							13 156	473
Morgan							11 225	230
Nicholas							27 964	650
Ohio							60 308	106
Pendleton							7 970	698
Pleasants							7 959	131
Pocahontas							9 687	942
Preston							31 346	651
Putnam							40 735	346
Raleigh							86 190	608
Randolph							29 608	1 040
Ritchie							11 700	454
Roane							15 630	484
Summers							15 424	353
Taylor							16 499	174
Tucker							8 759	421
Tyler							11 013	258
Upshur							24 904	355
Wayne							46 385	508

STATE OF WEST VIRGINIA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Webster							11 609	556
Wetzel							22 106	359
Wirt							5 281	235
Wood							92 885	368
Wyoming							35 334	502
TOTAL STATE	---	---	---	---	---	---	1 952 256	24 124

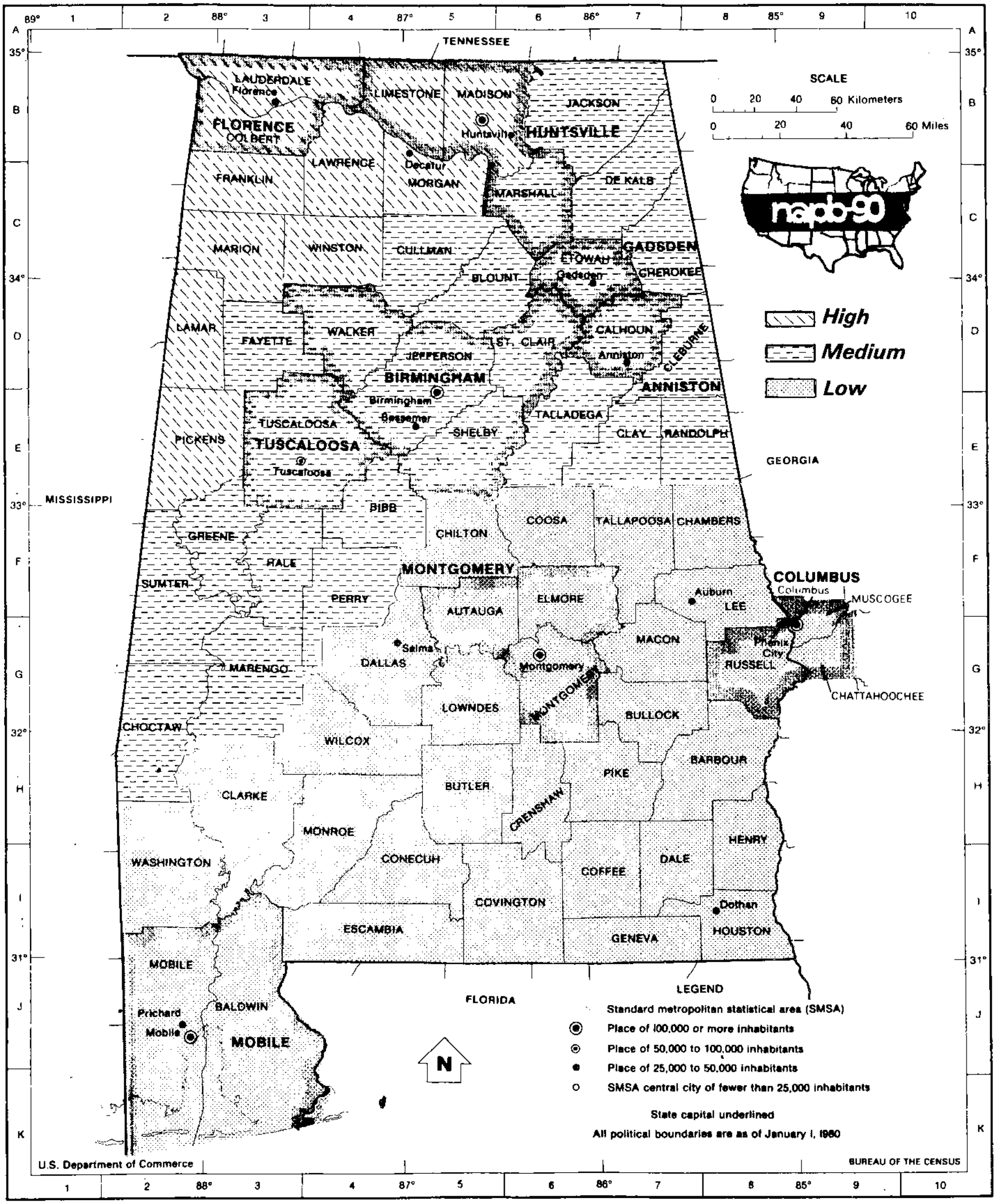
FEMA REGION IV -- FALLOUT RISK SUMMARY

Estimated 1985 Population: 42,442,705
Land Area: 379,046 square miles

STATE	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Alabama	---	---	643 193	7 378	1 796 772	19 032	1 519 180	24 329
Florida	---	---	4 566 549	9 312	675 092	2 745	6 641 705	51 340
Georgia	---	---	85 180	380	1 859 305	12 047	3 984 738	45 690
Kentucky	---	---	737 264	10 904	2 138 169	18 344	854 713	10 391
Mississippi*	---	---	1 035 736	21 597	1 086 907	19 343	494 490	6 234
North Carolina	---	---	98 361	554	261 391	2 496	5 874 022	45 793
South Carolina	---	---	291 814	938	191 165	1 683	2 860 443	27 586
Tennessee	58 176	995	2 565 689	21 551	864 696	10 207	1 257 955	8 177
TOTAL REGION*	58 176	995	10 023 786	72 614	8 873 497	85 897	23 487 246	219 540

*Interim data; to be corrected

FEMA Region 4 — ALABAMA — *Potential Fallout*



STATE OF ALABAMA -- FALLOUT RISK

Estimated 1985 Population: 3,959,145
Land Area: 50,739 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Autauga							33 760	597
Baldwin							88 981	1 590
Barbour					25 494	884		
Bibb							16 836	625
Blount					37 155	643		
Bullock							10 624	625
Butler							22 263	779
Calhoun					127 200	611		
Chambers							40 557	596
Cherokee					19 540	553		
Chilton							31 425	695
Choctaw					16 995	909		
Clark							28 781	1 203
Clay					13 582	605		
Cleburne					12 925	561		
Coffee							40 578	680
Colbert			53 878	589				
Conecuh							15 464	854
Coosa							11 336	657
Covington							37 040	1 038
Crenshaw							13 832	611
Cullman					64 229	738		
Dale							45 314	561
Dallas							55 090	975
De Kalb					55 080	778		

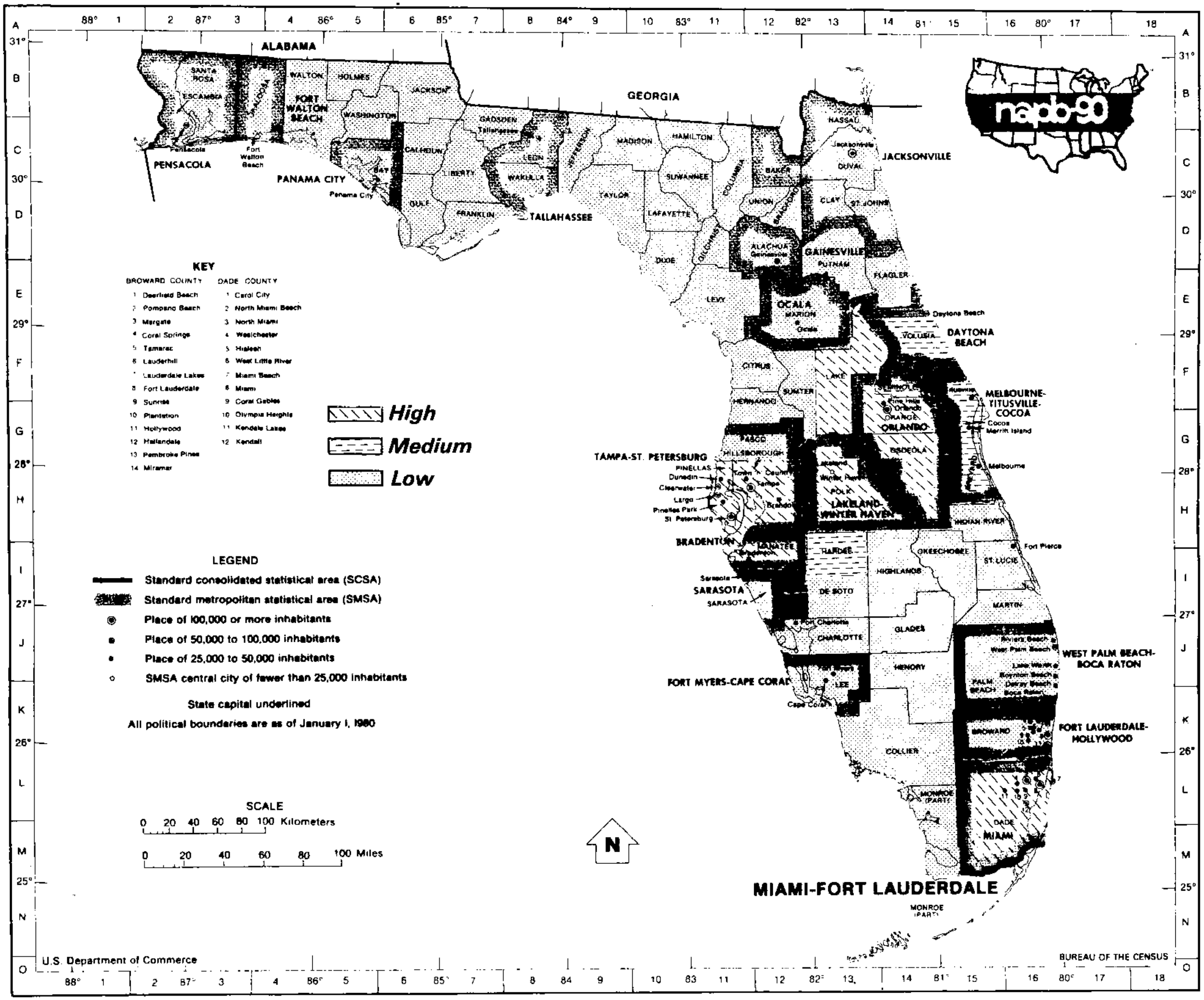
STATE OF ALABAMA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Elmore							47 012	622
Escambia							37 656	951
Etowah					103 697	542		
Fayette					19 147	630		
Franklin			28 748	643				
Geneva							23 783	578
Greene					11 243	631		
Hale					15 065	661		
Henry							15 326	557
Houston							79 172	577
Jackson					51 402	1 069		
Jefferson					671 808	1 119		
Lamar			16 420	605				
Lauderdale			81 917	661				
Lawrence			31 671	693				
Lee							79 209	609
Limestone			47 639	559				
Lowndes							13 093	714
Macon							25 901	614
Madison			213 250	806				
Marengo					24 957	982		
Marion			31 414	743				
Marshall					69 502	567		
Mobile							328 158	1 238
Monroe							22 468	1 019

STATE OF ALABAMA (Continued)

	VERY HIGH THREAT		HIGH THREAT		MEDIUM THREAT		LOW THREAT	
COUNTY	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Montgomery							206 993	793
Morgan			94 796	575				
Perry					15 045	719		
Pickens			21 915	890				
Pike							28 106	672
Randolph					20 236	585		
Russell							48 550	634
St Clair					44 539	646		
Shelby					75 418	800		
Sumter					17 202	907		
Talladega					77 228	753		
Tallapoosa							39 107	701
Tuscaloosa					139 201	1 336		
Walker					68 882	803		
Washington							17 443	1 081
Wilcox							15 322	883
Winston			21 545	614				
TOTAL STATE	---	---	643 193	7 378	1 796 772	19 032	1 519 180	24 329

FEMA Region 4 — FLORIDA — *Potential Fallout*



KEY

BROWARD COUNTY		DADE COUNTY	
1	Deerfield Beach	1	Carol City
2	Pompano Beach	2	North Miami Beach
3	Margate	3	North Miami
4	Coral Springs	4	Westchester
5	Tamarac	5	Hialeah
6	Lauderhill	6	West Little River
7	Lauderdale Lakes	7	Miami Beach
8	Fort Lauderdale	8	Miami
9	Sunrise	9	Coral Gables
10	Plantation	10	Olympia Heights
11	Hollywood	11	Kendale Lakes
12	Hallandale	12	Kendall
13	Pembroke Pines		
14	Miramar		

▨ ***High***
▤ ***Medium***
░ ***Low***

LEGEND

- ▬ Standard consolidated statistical area (SCSA)
- ▩ Standard metropolitan statistical area (SMSA)
- ◉ Place of 100,000 or more inhabitants
- ● Place of 50,000 to 100,000 inhabitants
- • Place of 25,000 to 50,000 inhabitants
- ○ SMSA central city of fewer than 25,000 inhabitants

State capital underlined

All political boundaries are as of January 1, 1980

SCALE

0 20 40 60 80 100 Kilometers

0 20 40 60 80 100 Miles

STATE OF FLORIDA -- FALLOUT RISK

Estimated 1985 Population: 11,883,346
Land Area: 63,397 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Alachua							789 260	902
Baker							17 591	585
Bay							111 180	758
Bradford							23 983	293
Brevard					343 585	995		
Broward							1 112 075	1 211
Calhoun							9 556	568
Charlotte							79 404	690
Citrus							78 546	629
Clay							84 793	592
Collier							116 981	1 994
Columbia							39 947	797
Dade			1 726 021	1 995				
De Soto							21 295	636
Dixie							9 476	701
Duval							623 035	776
Escambia							260 730	661
Flagler							16 816	491
Franklin							8 343	545
Gadsen							43 693	518
Gilchrist							7 267	354
Glades							6 765	763
Gulf							11 349	559
Hamilton							9 342	517
Hardee					20 818	637		

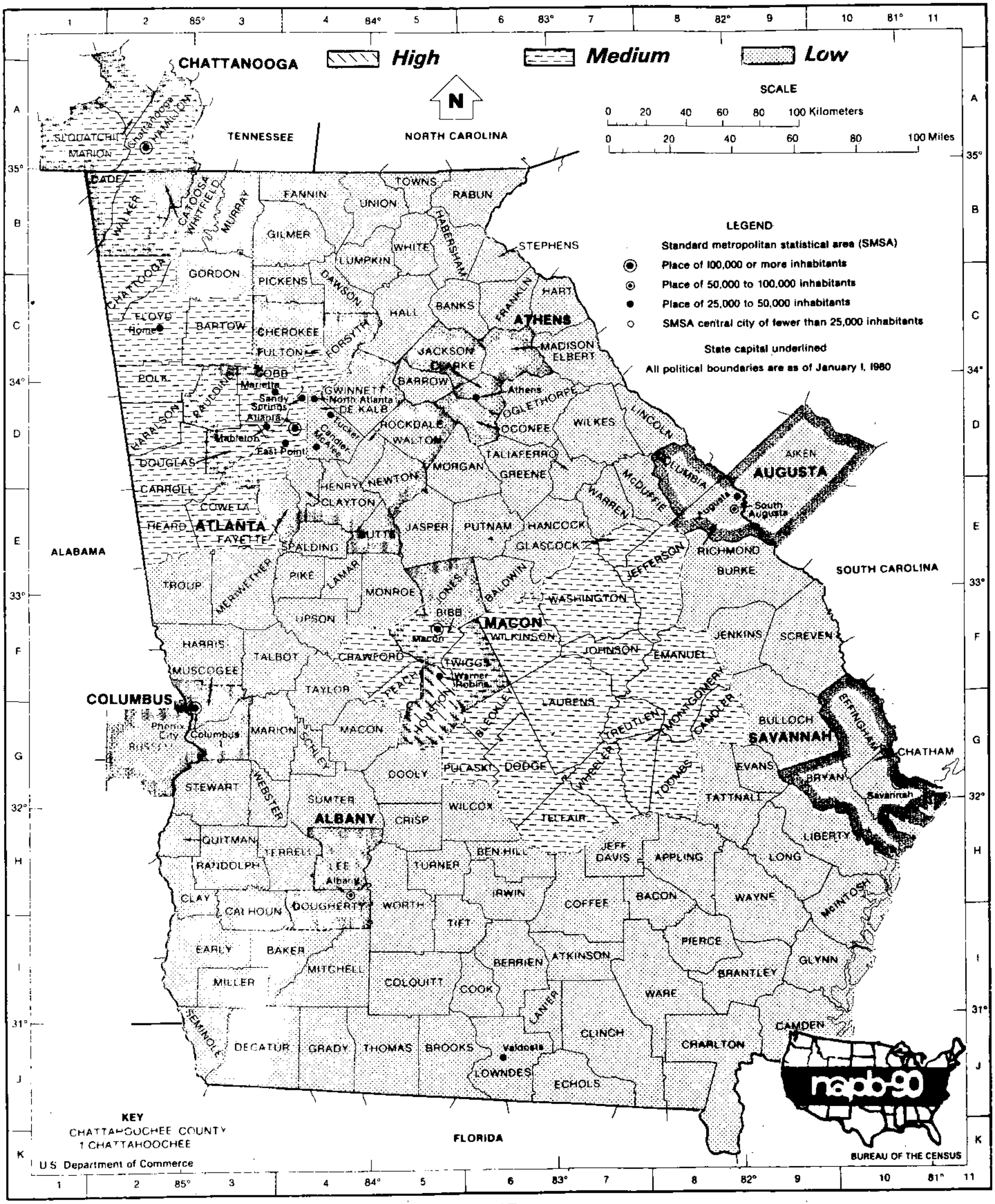
STATE OF FLORIDA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Hendry							22 565	1 163
Hernando							74 901	477
Highlands							58 524	1 029
Hillsborough			743 771	1 053				
Holmes							15 934	488
Indian River							77 629	497
Jackson							40 768	942
Jefferson							11 658	609
Lafayette							4 332	545
Lake			127 239	954				
Lee							246 738	803
Leon							168 231	676
Levy							24 623	1 100
Liberty							4 576	837
Madison							15 443	710
Manatee			174 772	947				
Marion							163 799	1 610
Martin							82 856	555
Monroe							71 003	1 034
Nassau							38 569	649
Okaloosa							131 901	936
Okeechobee							25 812	771
Orange			547 930	910				
Osceola			74 576	1 350				
Palm Beach							721 030	1 993
Pasco							232 936	738
Pinellas			808 500	280				
Polk			363 740	1 823				
Putnam							59 098	733
St Johns							67 087	617

STATE OF FLORIDA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
St Lucie							117 109	581
Santa Rosa							65 097	1 024
Sarasota							246 395	573
Seminole							232 587	298
Sumter							29 162	561
Suwannee							25 644	690
Taylor							18 167	1 058
Union							11 562	246
Volusia					310 689	1 113		
Wakulla							12 889	601
Walton							25 509	1 066
Washington							16 144	590
TOTAL STATE	---	---	4 566 549	9 312	675 092	2 745	6 641 705	51 340

FEMA Region 4 — GEORGIA — *Potential Fallout*



STATE OF GEORGIA -- FALLOUT RISK

Estimated 1985 Population: 5,929,233
Land Area: 58,117 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Appling							16 441	510
Atkinson							6 254	344
Bacon							9 572	286
Baker							3 541	347
Baldwin							38 659	258
Banks							9 940	234
Barrow							24 768	163
Bartow					44 059	456		
Ben Hill							17 067	254
Berrien							13 842	456
Bibb					158 476	253		
Bleckley					10 645	219		
Brantley							9 430	444
Brooks							15 299	491
Bryan							12 164	441
Bulloch							37 271	678
Burke							20 728	833
Butts							15 169	187
Calhoun							5 527	284
Camden							17 682	649
Candler					7 833	248		
Carroll					63 098	502		
Catoosa							38 746	163
Charlton							7 741	780
Chatham							214 908	444

STATE OF GEORGIA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Chattahoochee							20 139	250
Chattooga					21 345	314		
Cherokee							65 533	424
Clarke							76 890	122
Clay							3 278	197
Clayton							165 686	148
Clinch							6 863	821
Cobb					368 393	343		
Coffee							28 818	602
Colquitt							36 484	556
Columbia							51 795	290
Cook							13 889	232
Coweta					43 886	444		
Crawford					7 087	328		
Crisp							20 258	275
Dade					11 389	176		
Dawson							5 873	210
Decatur							26 635	586
De Kalb							506 550	270
Dodge					16 747	504		
Dooly							10 616	397
Dougherty							103 630	330
Douglas					65 631	203		
Early							13 150	516
Echols							2 235	420
Effingham							21 091	482
Elbert							19 042	367
Emanuel					21 366	688		
Evans							8 504	186
Fannin							15 266	384

STATE OF GEORGIA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Fayette							42 806	199
Floyd					78 516	519		
Forsyth							34 431	226
Franklin							15 569	264
Fulton					621 030	534		
Gilmer							11 822	427
Glascock							2 331	144
Glynn							60 350	412
Gordon							32 616	355
Grady							21 318	459
Greene							11 978	390
Gwinnett							246 112	435
Habersham							27 014	278
Hall							83 207	379
Hancock							9 302	469
Haralson					19 589	283		
Harris							16 380	464
Hart							19 220	230
Heard					6 750	292		
Henry							43 673	321
Houston			85 180	380				
Irwin							8 813	362
Jackson							27 158	342
Jasper							7 744	371
Jeff Davis							11 846	335
Jefferson					18 725	529		
Jenkins							8 421	353
Johnson					8 602	307		
Jones							18 579	394
Lamar							12 294	186
Lanier							5 644	194

STATE OF GEORGIA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Laurens					38 253	816		
Lee							14 081	358
Liberty							41 837	517
Lincoln							6 892	196
Long							5 675	402
Lowndes							72 742	507
Lumpkin							12 036	287
McDuffie							19 633	256
McIntosh							8 025	425
Macon							14 188	404
Madison							19 508	285
Marion							5 384	366
Meriwether							20 661	506
Miller							6 795	284
Mitchell							21 841	512
Monroe							14 949	397
Montgomery					6 934	244		
Morgan							12 230	349
Murray							21 438	345
Muscogee							177 080	218
Newton							38 957	277
Oconee							14 648	186
Oglethorpe							9 543	442
Paulding					29 957	312		
Peach					19 200	151		
Pickens							13 303	232
Pierce							12 730	344
Pike							8 631	219
Polk					33 165	312		
Pulaski					8 959	249		

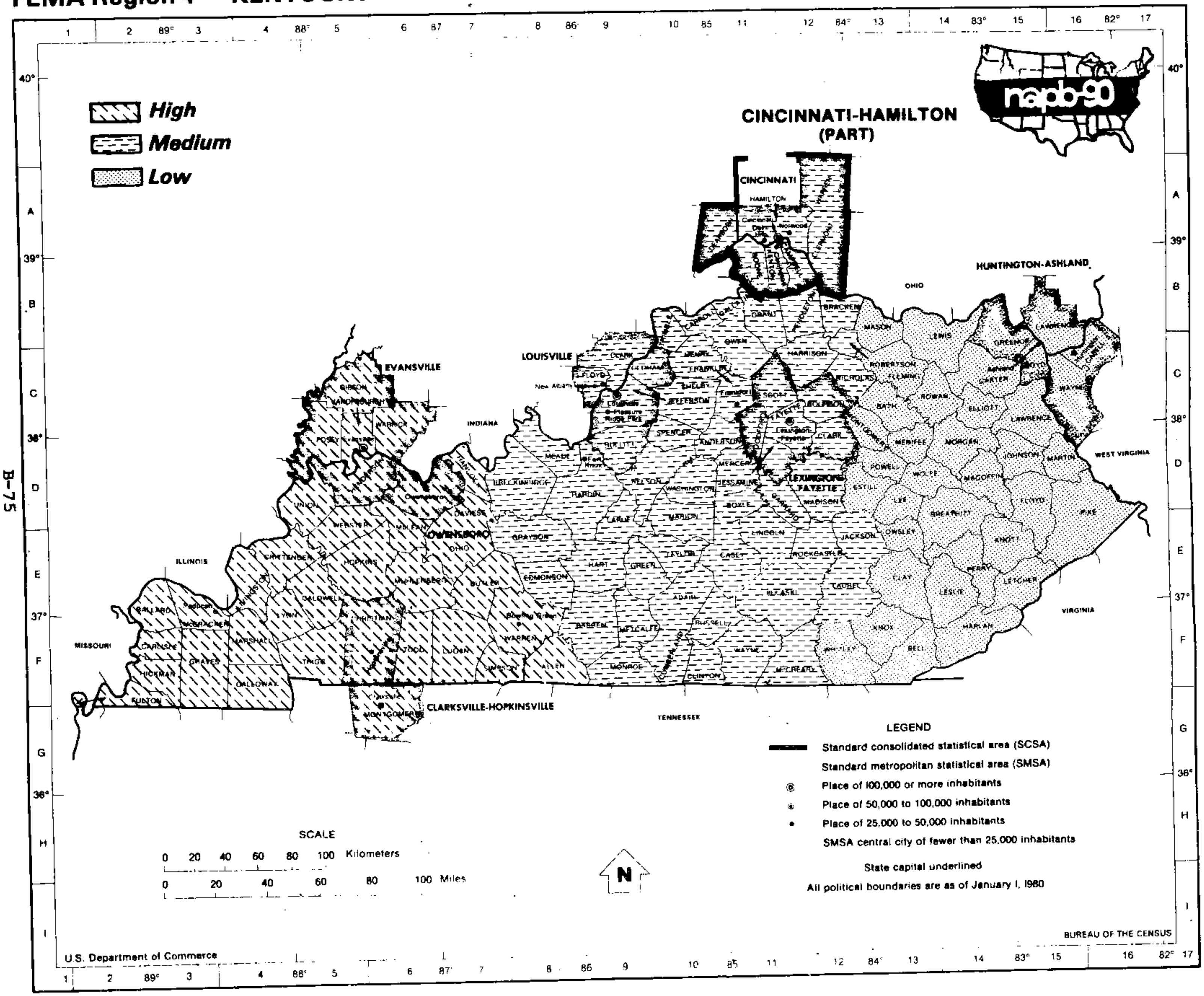
STATE OF GEORGIA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Putnam							11 700	344
Quitman							2 156	146
Rabun							10 840	370
Randolph							9 381	481
Richmond							189 036	326
Rockdale							44 501	132
Schley							3 354	169
Screven							14 396	655
Seminole							8 775	225
Spalding							51 453	199
Stephens							22 239	177
Stewart							5 862	452
Sumter							30 374	488
Talbot							6 496	395
Taliaferro							1 986	196
Tattnall							17 783	484
Taylor							8 082	382
Telfair							11 042	444
Terrell							11 943	337
Thomas							38 187	551
Tift							33 722	268
Toombs					23 633	371		
Towns							6 279	165
Treutlen					5 997	202		
Troup							53 248	415
Turner							9 643	289
Twiggs					9 744	362		
Union							10 583	320
Upson							26 591	326
Walker					55 155	446		

STATE OF GEORGIA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Walton							32 390	330
Ware							37 123	907
Warren							6 439	286
Washington					19 307	683		
Wayne							22 128	647
Webster							2 077	210
Wheeler					5 056	299		
White							11 205	242
Whitfield							68 141	291
Wilcox							7 559	382
Wilkes							11 356	470
Wilkinson					10 778	458		
Worth							18 259	575
TOTAL STATE	---	---	85 180	380	1 859 305	12 047	3 984 738	45 690

FEMA Region 4 — KENTUCKY — *Potential Fallout*


High
Medium
Low
CINCINNATI-HAMILTON
(PART)
CINCINNATI
HAMILTON
HUNTINGTON-ASHLAND
LOUISVILLE
EVANSVILLE
OWENSBORO
CLARKSVILLE-HOPKINSVILLE
LEXINGTON-FAYETTE
OHIO
INDIANA
ILLINOIS
MISSOURI
TENNESSEE
VIRGINIA
WEST VIRGINIA
LEGEND
Standard consolidated statistical area (SCSA)
Standard metropolitan statistical area (SMSA)
Place of 100,000 or more inhabitants
Place of 50,000 to 100,000 inhabitants
Place of 25,000 to 50,000 inhabitants
SMSA central city of fewer than 25,000 inhabitants
State capital underlined
All political boundaries are as of January 1, 1980
SCALE
0 20 40 60 80 100 Kilometers
0 20 40 60 80 100 Miles
N
BUREAU OF THE CENSUS
U.S. Department of Commerce

S T A T E   O F   K E N T U C K Y -- F A L L O U T   R I S K

Estimated 1985 Population: 3,730,146
Land Area: 39,639 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Adair					15 857	407		
Allen			14 370	338				
Anderson					13 522	204		
Ballard			8 186	254				
Barren					34 692	482		
Bath							10 263	278
Bell							34 201	361
Boone					51 553	246		
Bourbon					19 147	292		
Boyd							54 575	161
Boyle					25 106	182		
Bracken					7 555	203		
Breathitt							16 453	495
Breckinridge					16 566	565		
Bullitt					45 100	300		
Butler			11 958	431				
Caldwell			13 265	347				
Calloway			30 551	386				
Campbell					80 896	152		
Carlisle			5 262	191				
Carroll					9 850	130		
Carter							25 814	407
Casey					15 293	445		
Christian			64 360	722				
Clark					29 442	255		

STATE OF KENTUCKY (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Clay							23 867	471
Clinton					9 984	196		
Crittenden			8 896	360				
Cumberland					7 334	304		
Daviess			88 834	463				
Edmonson					11 567	302		
Elliott					6 923	234		
Estill					15 107	256		
Fayette					211 628	285		
Fleming							12 524	351
Floyd							51 295	393
Franklin					44 192	212		
Fulton			8 234	211				
Gallatin					4 962	99		
Garrard					11 397	232		
Grant					14 477	259		
Graves			37 712	557				
Grayson					22 631	493		
Green					10 950	289		
Greenup							38 515	347
Hancock			8 242	189				
Hardin					90 545	629		
Harlan							42 139	468
Harrison					15 678	310		
Hart					17 009	412		
Henderson			42 474	438				
Henry					13 467	291		
Hickman			5 618	245				
Hopkins			46 424	552				
Jackson					12 586	346		

STATE OF KENTUCKY (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Jefferson					682 179	386		
Jessamine					28 497	175		
Johnson							25 895	264
Kenton							136 391	163
Knott					18 395	352		
Knox							30 205	358
Larue					12 018	263		
Laurel					42 251	434		
Lawrence							15 007	420
Lee							7 781	211
Leslie							15 407	402
Letcher							30 977	339
Lewis							14 458	484
Lincoln					19 180	332		
Livingston			9 131	312				
Logan			26 045	556				
Lyon			6 425	209				
McCracken			61 367	251				
McCreary					16 306	427		
McLean			9 948	256				
Madison					55 644	443		
Magoffin							14 251	310
Marion					17 699	347		
Marshall			25 976	304				
Martin							1 063	231
Mason							17 091	241
Meade					22 789	307		
Menifee							5 353	203
Mercer					19 405	250		
Metcalfe					10 359	291		

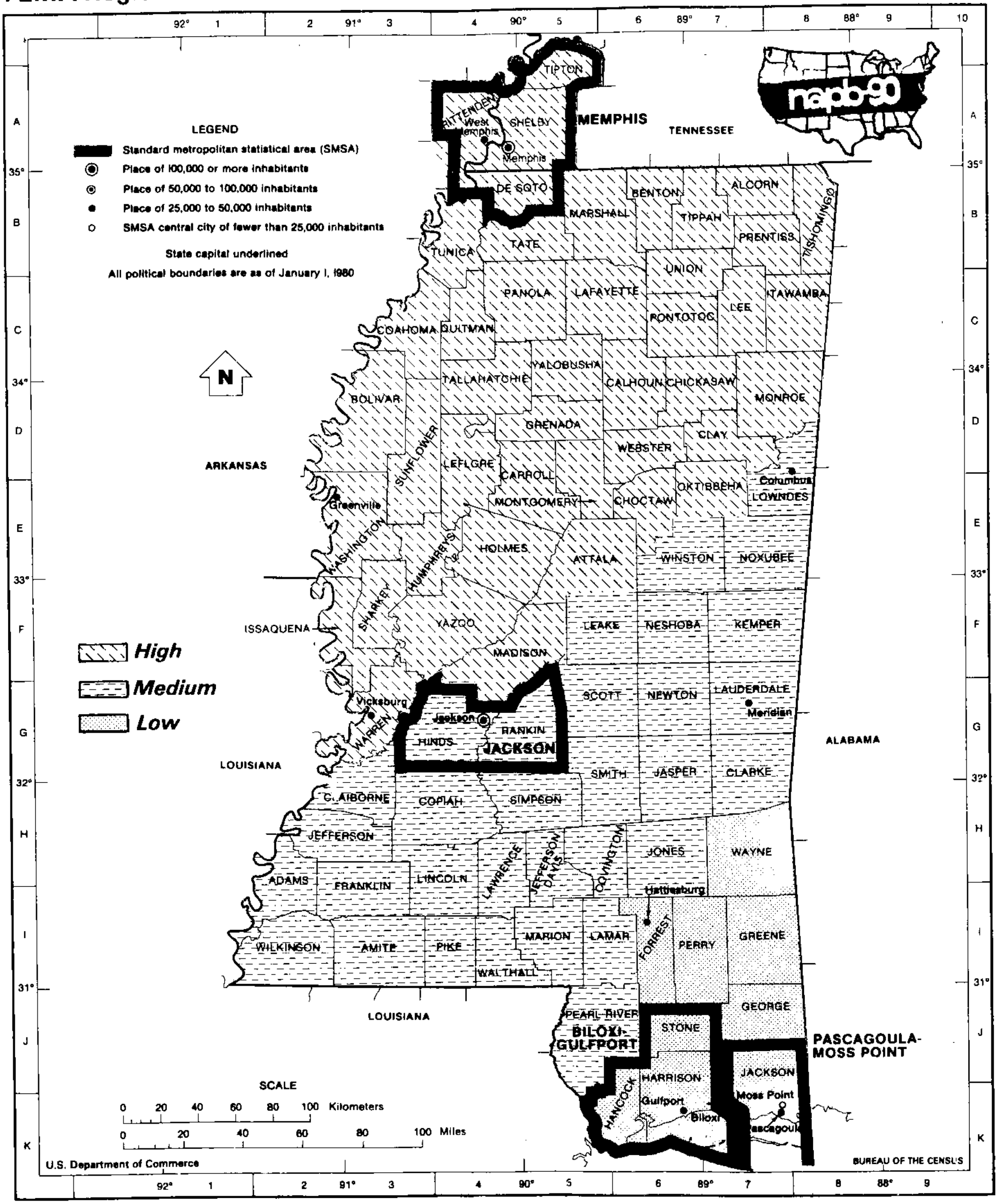
STATE OF KENTUCKY (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Monroe					12 618	331		
Montgomery							20 410	199
Morgan							12 122	382
Muhlenberg			31 696	478				
Nelson					28 923	424		
Nicholas					7 330	197		
Ohio			21 875	596				
Oldham					30 519	190		
Owen					9 217	354		
Owsley							5 641	198
Pendleton					10 767	281		
Perry							35 419	341
Pike							83 875	785
Powell							11 907	180
Pulaski					49 129	660		
Robertson					2 383	100		
Rockcastle					14 664	318		
Rowan							19 043	282
Russell					15 141	250		
Scott					21 971	286		
Shelby					24 243	385		
Simpson			14 936	236				
Spencer					6 148	192		
Taylor					22 162	270		
Todd			10 649	377				
Trigg			9 386	421				
Trimble					6 321	148		
Union			17 807	341				
Warren			82 907	547				
Washington					10 291	301		

STATE OF KENTUCKY (Continued)

COUNTY	VERY HIGH THREAT POPULATION	VERY HIGH THREAT AREA	HIGH THREAT POPULATION	HIGH THREAT AREA	MEDIUM THREAT POPULATION	MEDIUM THREAT AREA	LOW THREAT POPULATION	LOW THREAT AREA
Wayne					17 759	446		
Webster			14 730	336				
Whitley							35 619	443
Wolfe							7 152	223
Woodford					18 845	192		
TOTAL STATE	---	---	737 264	10 904	2 138 169	18 344	854 713	10 391

FEMA Region 4 — MISSISSIPPI — *Potential Fallout*



STATE OF MISSISSIPPI -- FALLOUT RISK

Estimated 1985 Population: 2,617,133
Land Area: 47,174 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Adams					39 119	456		
Alcorn			32 183	401				
Amite					13 288	732		
Attala			18 901	737				
Benton			8 126	407				
Bolivar			45 246	892				
Calhoun			15 196	573				
Carroll			9 173	634				
Chickasaw			17 923	503				
Choctaw			8 542	420				
Claiborne					12 621	494		
Clarke					16 823	692		
Clay			22 053	415				
Coahoma			35 424	559				
Copiah					25 744	779		
Covington					15 888	416		
De Soto			58 091	483				
Forrest							70 812	469
Franklin					8 373	566		
George							16 044	483
Greene							9 382	718
Grenada			21 543	421				
Hancock							29 671	478
Harrison							171 484	581
Hinds					261 467	875		

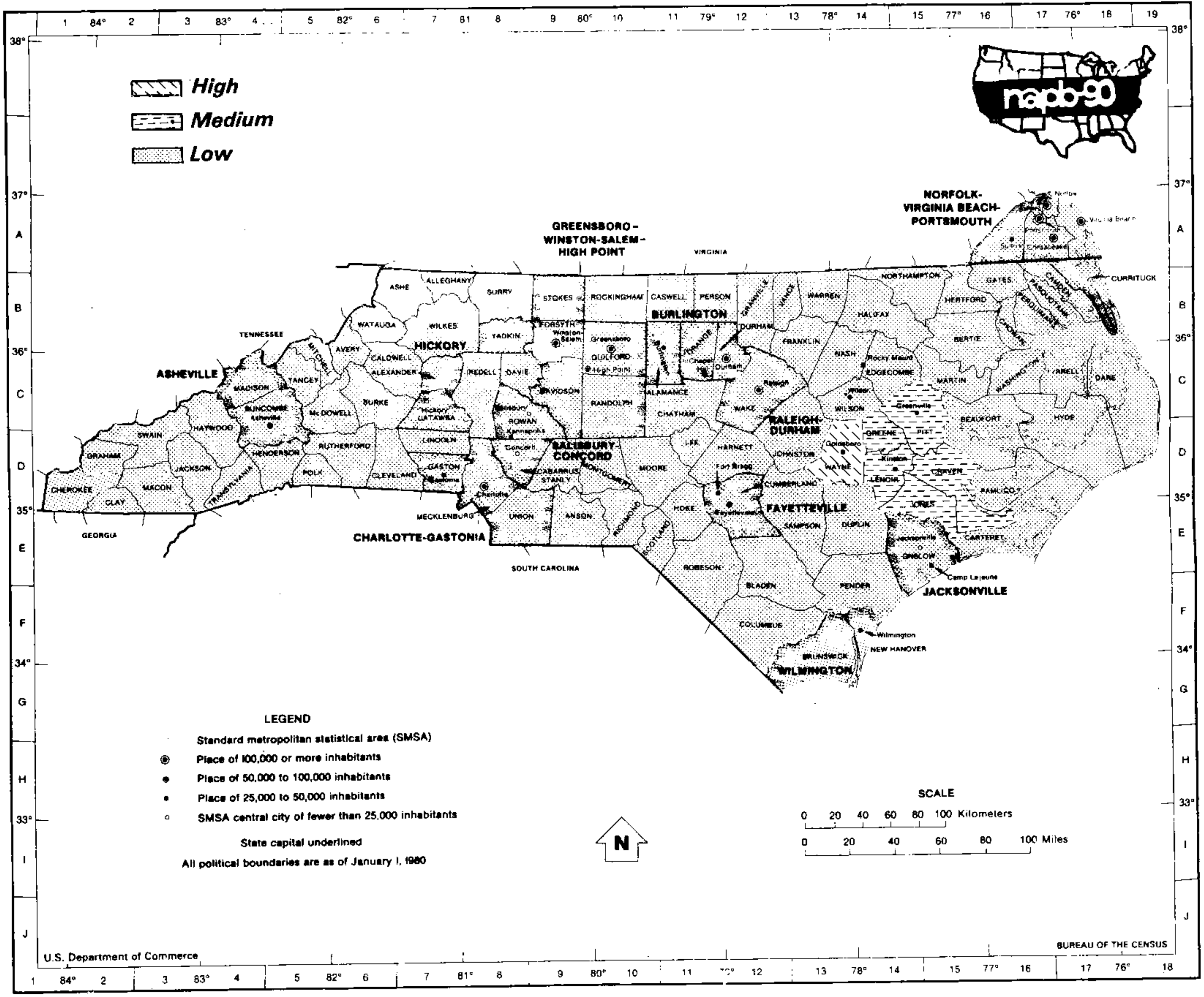
STATE OF MISSISSIPPI (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Holmes			23 784	759				
Humphreys							13 934	430
Issaquena			2 147	406				
Itawamba			20 299	541				
Jackson							124 917	731
Jasper					17 173	678		
Jefferson					9 793	523		
Jefferson Davis					14 104	409		
Jones					64 507	695		
Kemper					10 373	766		
LaFayette			32 522	609				
Lamar					26 768	499		
Lauderdale					80 005	705		
Lawrence					13 144	435		
Leake					18 683	584		
Lee			61 285	451				
LeFlore			42 369	605				
Lincoln					31 099	586		
Lowndes					61 314	517		
Madison			45 724	717				
Marion					27 571	548		
Marshall			32 405	709				
Monroe			36 628	772				
Montgomery			12 660	408				
Neshoba					24 674	571		
Newton					20 288	580		
Noxubee					12 537	698		
Oktibbeha			38 129	459				
Panola			29 785	695				
Pearl River					38 167	819		

STATE OF MISSISSIPPI (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Perry							10 646	651
Pike					36 699	410		
Pontotoc			21 744	499				
Prentiss			24 682	417				
Quitman			11 334	406				
Rankin					80 192	782		
Scott					25 256	610		
Sharkey			8 076	435				
Simpson					24 762	591		
Smith					14 554	635		
Stone							10 110	446
Sunflower			37 634	707				
Tallahatchie			16 124	651				
Tate			21 311	406				
Tippah			18 985	458				
Tishomingo							17 338	434
Tunica			9 299	460				
Union			21 595	417				
Walthall					12 870	404		
Warren			51 872	597				
Washington			72 533	733				
Wayne							20 152	813
Webster			10 196	424				
Wilkinson					10 484	678		
Winston					18 567	610		
Yalobusha			13 387	478				
Yazoo			26 826	933				
TOTAL STATE	---	---	1 035 736	21 597	1 086 907	19 343	494 490	6 234

FEMA Region 4 — NORTH CAROLINA — Potential Fallout



▨ High
▤ Medium
░ Low
NORFOLK-VIRGINIA BEACH-PORTSMOUTH
GREENSBORO-WINSTON-SALEM-HIGH POINT
BURLINGTON
HICKORY
ASHEVILLE
RALEIGH-DURHAM
SALISBURY-CONCORD
CHARLOTTE-GASTONIA
FAYETTEVILLE
JACKSONVILLE
WILMINGTON
VIRGINIA
TENNESSEE
GEORGIA
SOUTH CAROLINA
CURRITUCK
NEW HANOVER
Camp Lejeune
Wilmington
LEGEND
Standard metropolitan statistical area (SMSA)
◉ Place of 100,000 or more inhabitants
● Place of 50,000 to 100,000 inhabitants
• Place of 25,000 to 50,000 inhabitants
○ SMSA central city of fewer than 25,000 inhabitants
State capital underlined
All political boundaries are as of January 1, 1980
SCALE
0 20 40 60 80 100 Kilometers
0 20 40 60 80 100 Miles
N
U.S. Department of Commerce
BUREAU OF THE CENSUS
napb-90

STATE OF NORTH CAROLINA -- FALLOUT RISK

Estimated 1985 Population: 6,233,774
Land Area: 48,843 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Alamance							102 865	433
Alexander							26 671	259
Alleghany							9 941	234
Anson							26 266	533
Ashe							23 263	426
Avery							15 040	247
Beaufort							43 217	826
Bertie							21 491	701
Bladen							30 794	879
Brunswick							45 643	861
Buncombe							166 717	659
Burke							75 193	505
Cabarrus							93 522	364
Caldwell							68 745	471
Camden							5 866	241
Carteret							48 181	525
Caswell							22 441	427
Catawba							112 583	396
Chatham							35 680	708
Cherokee							20 231	452
Chowan							12 995	181
Clay							7 093	214
Cleveland							84 762	468
Columbus							51 937	939
Craven					77 821	702		

STATE OF NORTH CAROLINA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Cumberland							252 353	657
Currituck							13 318	256
Dare							17 107	391
Davidson							118 693	548
Davie							27 416	267
Duplin							41 650	819
Durham							160 837	298
Edgecombe							58 790	506
Forsyth							258 622	412
Franklin							32 305	494
Gaston							170 614	357
Gates							9 357	338
Graham							7 104	289
Granville							36 884	534
Greene					16 464	266		
Guilford							327 323	651
Halifax							56 258	724
Harnett							62 366	601
Haywood							47 835	555
Henderson							66 501	375
Hertford							24 076	356
Hoke							22 566	391
Hyde							5 925	624
Iredell							87 260	574
Jackson							27 318	490
Johnston							76 426	795
Jones					9 806	470		
Lee							40 039	259
Lenoir					61 276	402		
Lincoln							45 086	298

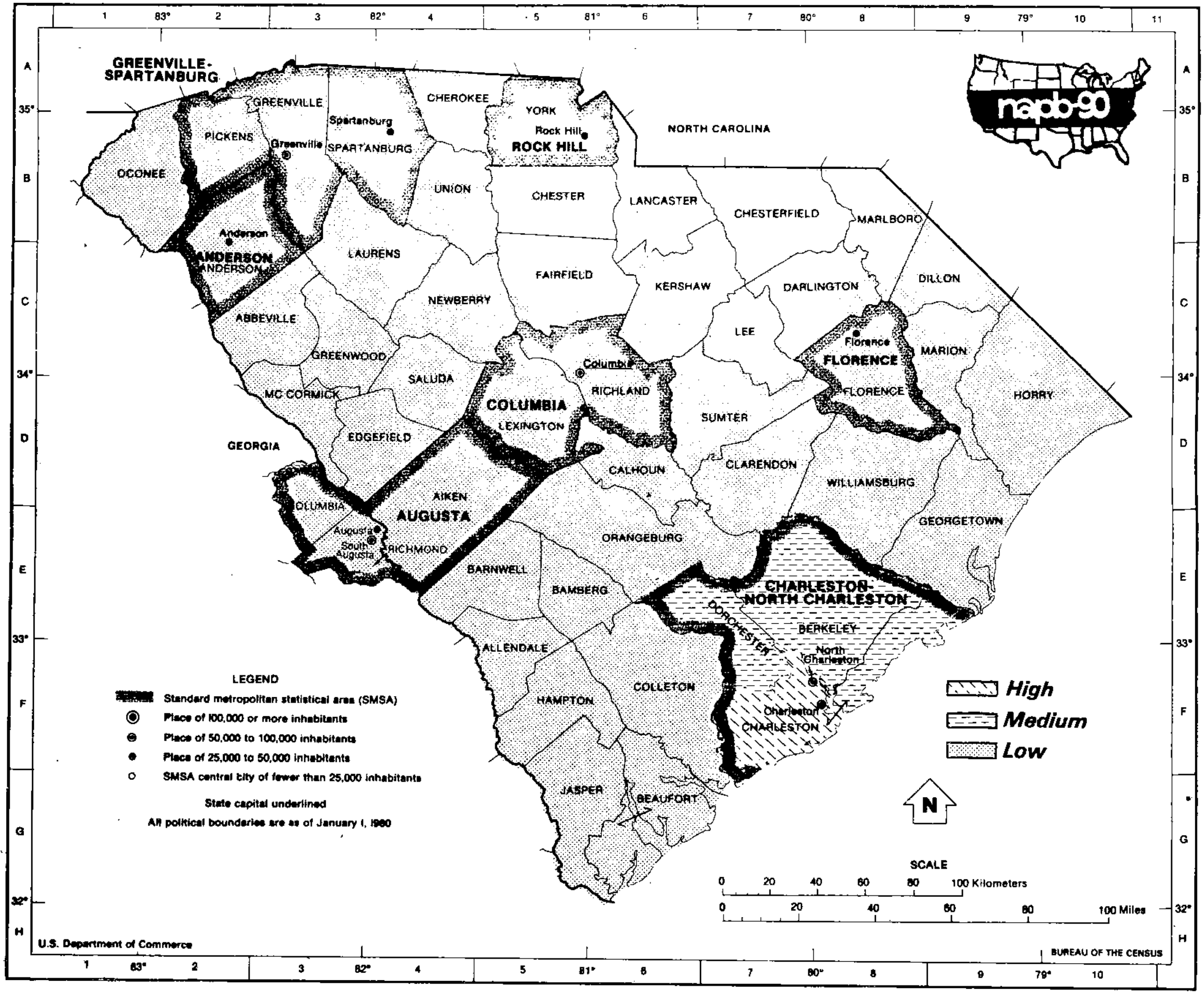
STATE OF NORTH CAROLINA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
McDowell							36 454	437
Macon							23 466	517
Madison							17 250	451
Martin							27 437	461
Mecklenburg							439 986	528
Mitchell							14 258	222
Montgomery							23 665	490
Moore							55 254	701
Nash							70 931	540
New Hanover							112 147	185
Northampton							22 485	538
Onslow							120 039	763
Orange							81 875	400
Pamlico							10 925	341
Pasquotank							29 502	228
Pender							24 268	875
Perquimans							9 913	246
Person							30 316	398
Pitt					96 024	656		
Polk							14 758	238
Randolph							97 642	789
Richmond							45 644	477
Robeson							106 472	949
Rockingham							85 801	569
Rowan							102 667	519
Rutherford							56 501	568
Sampson							50 707	947
Scotland							34 149	319
Stanly							50 203	396
Stokes							35 319	452

STATE OF NORTH CAROLINA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Surry							60 500	539
Swain							10 818	526
Transylvania							25 249	378
Tyrrell							4 130	407
Union							77 802	639
Vance							38 320	249
Wake							346 147	854
Warren							16 236	427
Washington							14 473	332
Watauga							34 273	314
Wayne			98 361	554				
Wilkes							60 948	752
Wilson							64 997	374
Yadkin							29 498	336
Yancey							15 431	314
TOTAL STATE	---	---	98 361	554	261 391	2 496	5 874 022	45 793

FEMA Region 4 — SOUTH CAROLINA — *Potential Fallout*



STATE OF SOUTH CAROLINA -- FALLOUT RISK

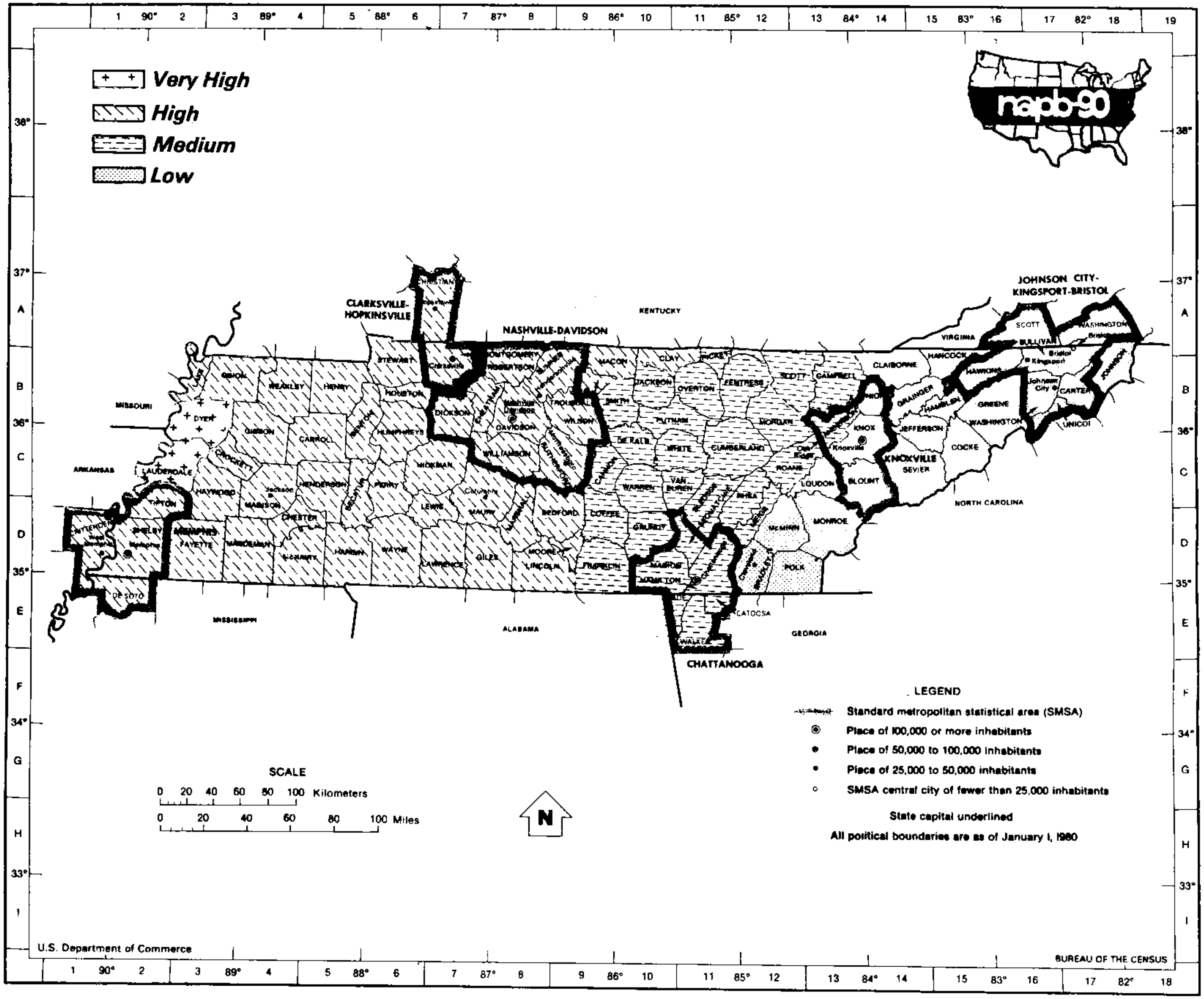
Estimated 1985 Population: 3,343,422
Land Area: 30,207 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	VERY HIGH RISK [GT 15000R] AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	HIGH RISK [EQ/GT 6000R LT 15000R] AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	MEDIUM RISK [EQ/GT 3000R LT 6000R] AREA	LOW RISK [LT 3000R] POPULATION	LOW RISK [LT 3000R] AREA
Abbeville							22 919	508
Aiken							113 409	1 092
Allendale							10 904	413
Anderson							139 797	718
Bamberg							18 097	395
Barnwell							20 308	558
Beaufort							81 853	579
Berkeley					117 319	1 108		
Calhoun							11 431	380
Charleston			291 814	938				
Cherokee							41 186	396
Chester							30 992	580
Chesterfield							38 454	802
Clarendon							28 112	602
Colleton							33 866	1 052
Darlington							64 933	563
Dillon							32 316	406
Dorchester					73 846	575		
Edgefield							17 809	490
Fairfield							20 805	685
Florence							114 936	804
Georgetown							47 533	822
Greenville							303 866	795
Greenwood							60 352	451
Hampton							18 899	561

STATE OF SOUTH CAROLINA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Horry							126 279	1 143
Jasper							14 369	655
Kershaw							42 124	723
Lancaster							55 843	552
Laurens							53 481	712
Lee							18 510	411
Lexington							156 949	707
McCormick							7 183	350
Marion							34 924	493
Marlboro							32 459	483
Newberry							32 044	634
Oconee							51 780	629
Orangeburg							86 706	1 112
Pickens							85 403	499
Richland							282 019	762
Saluda							17 017	456
Spartanburg							209 163	814
Sumter							94 839	665
Union							30 826	515
Williamsburg							39 284	934
York							116 464	685
TOTAL STATE	---	---	291 814	938	191 165	1 683	2 860 443	27 586

FEMA Region 4 — TENNESSEE — *Potential Fallout*



+ Very High
▨ High
▤ Medium
░ Low
CLARKSVILLE-HOPKINSVILLE
NASHVILLE-DAVIDSON
JOHNSON CITY-KINGSPORT-BRISTOL
KNOXVILLE
CHATTANOOGA
MEMPHIS
KENTUCKY
VIRGINIA
NORTH CAROLINA
GEORGIA
ALABAMA
MISSISSIPPI
ARKANSAS
MISSOURI
LEGEND
Standard metropolitan statistical area (SMSA)
Place of 100,000 or more inhabitants
Place of 50,000 to 100,000 inhabitants
Place of 25,000 to 50,000 inhabitants
SMSA central city of fewer than 25,000 inhabitants
State capital underlined
All political boundaries are as of January 1, 1980
SCALE
0 20 40 60 80 100 Kilometers
0 20 40 60 80 100 Miles
N
U.S. Department of Commerce
BUREAU OF THE CENSUS
napb-90

S T A T E O F T E N N E S S E E -- F A L L O U T R I S K

Estimated 1985 Population: 4,746,516
Land Area: 40,930 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Anderson					69 607	339		
Bedford			28 701	475				
Benton			15 088	392				
Bledsoe					9 278	407		
Blount							81 926	558
Bradley							70 601	327
Campbell					35 490	479		
Cannon					10 725	266		
Carroll			28 302	600				
Carter							51 658	341
Cheatham			23 557	303				
Chester			12 837	289				
Claiborne							26 644	432
Clay			8 061	227				
Cocke							29 318	432
Coffee					40 569	429		
Crockett			13 895	266				
Cumberland					31 190	682		
Davidson			487 241	501				
Decatur			10 958	330				
DeKalb					13 881	291		
Dickson			31 624	491				
Dyer	33 920	520						
Fayette			24 623	705				
Fentress					15 603	498		

STATE OF TENNESSEE (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Franklin					33 382	543		
Gibson			48 338	602				
Giles			24 789	610				
Grainger							17 155	273
Greene							56 054	619
Grundy					14 085	361		
Hamblen							59 098	156
Hamilton					282 988	539		
Hancock							6 751	
Hardeman			23 322	670				
Hardin			22 314	578				
Hawkins							45 137	486
Haywood			20 547	534				
Henderson			21 854	520				
Henry			29 023	560				
Hickman			15 927	610				
Houston			7 011	200				
Humphreys			15 702	527				
Jackson					9 146	308		
Jefferson							35 027	266
Johnson							14 302	297
Knox							331 840	506
Lake			8 310	168				
Lauderdale	24 256	475						
Lawrence			34 625	617				
Lewis			10 580	282				
Lincoln			26 229	571				
Loudon							30 719	235
McMinn							43 710	429
McNairy			23 337	562				

STATE OF TENNESSEE (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Macon			15 667	307				
Madison			76 858	558				
Marion					24 502	512		
Marshall			20 095	376				
Maury			51 863	616				
Meigs					7 787	189		
Monroe							30 048	648
Montgomery			88 788	539				
Moore			4 907	129				
Morgan					17 290	523		
Obion			32 980	550				
Overton					18 095	433		
Perry			6 427	412				
Pickett					4 510	159		
Polk							13 605	437
Putnam					50 464	399		
Rhea					24 819	309		
Roane					49 436	357		
Robertson			38 717	476				
Rutherford			97 308	605				
Scott					20 635	528		
Sequatchie					8 618	266		
Sevier							47 229	590
Shelby			796 450	772				
Smith					14 564	313		
Stewart			9 154	454				
Sullivan							145 705	415
Sumner			92 025	529				
Tipton			35 021	454				
Trousdale			5 488	114				

STATE OF TENNESSEE (Continued)

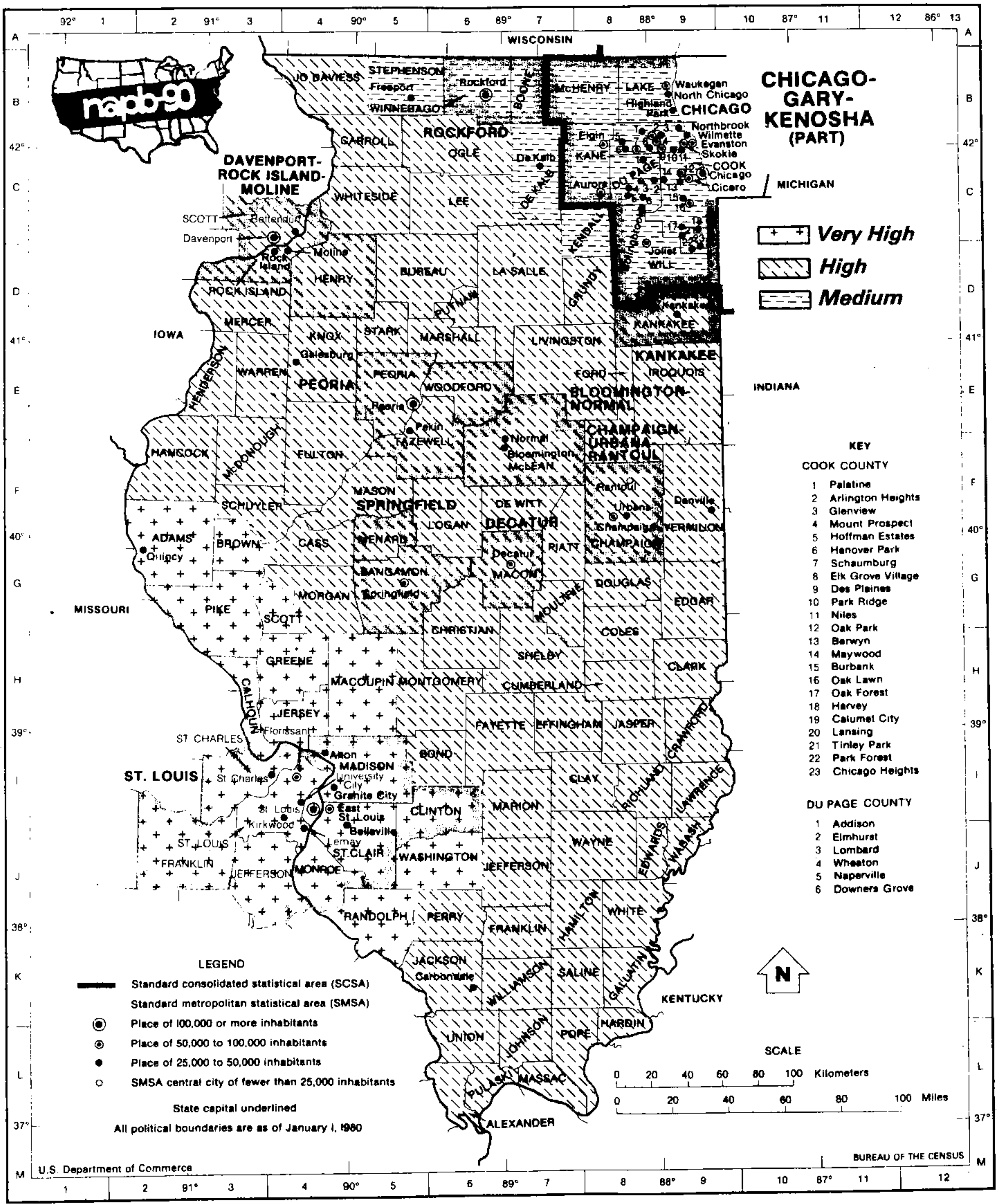
COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Unicoi							16 911	186
Union							12 358	218
Van Buren					4 782	273		
Warren					33 436	431		
Washington							92 699	326
Wayne			14 115	734				
Weakley			33 395	581				
White					19 814	373		
Williamson			68 284	584				
Wilson			61 352	571				
TOTAL STATE	58 176	995	2 565 689	21 551	864 696	10 207	1 257 955	8 177

FEMA REGION V -- FALLOUT RISK SUMMARY

Estimated 1985 Population: 45,687,087
Land Area: 323,545 square miles

STATE	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Illinois	812 787	7 676	3 000 057	41 187	7 744 412	6 723	---	---
Indiana	---	---	1 873 950	18 787	3 625 686	17 176	---	---
Michigan	---	---	128 678	5 140	8 902 100	51 879	---	---
Minnesota	489 329	32 604	3 691 902	46 943	---	---	---	---
Ohio	---	---	---	---	3 714 442	13 639	6 924 191	27 367
Wisconsin	---	---	253 343	7 882	4 526 210	46 542	---	---
TOTAL REGION V	1 302 116	40 280	8 947 930	119 939	28 512 850	135 959	6 924 191	27 367

FEMA Region 5 — ILLINOIS — *Potential Fallout*



STATE OF ILLINOIS -- FALLOUT RISK

Estimated 1985 Population: 11,557,256
Land Area: 55,586 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Adams	70 543	852						
Alexander			11 799	236				
Bond			16 041	377				
Boone					28 123	282		
Brown	5 480	306						
Bureau			37 832	869				
Calhoun	5 833	250						
Carroll			17 942	444				
Cass			14 387	374				
Champaign			170 697	998				
Christian			36 273	710				
Clark			16 728	505				
Clay			15 596	469				
Clinton	33 632	472						
Coles			52 388	509				
Cook					5 274 484	958		
Crawford			20 950	446				
Cumberland			10 918	346				
DeKalb					73 019	634		
DeWitt			17 938	397				
Douglas			19 563	417				
Du Page					711 968	337		
Edgar			21 269	623				
Edwards			8 235	223				
Effingham			31 633	478				

STATE OF ILLINOIS (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Fayette			22 339	709				
Ford			14 938	486				
Franklin			43 111	414				
Fulton			40 582	871				
Gallatin			7 644	325				
Green	15 939	543						
Grundy			31 503	423				
Hamilton			9 224	436				
Hancock			23 650	795				
Hardin			5 474	181				
Henderson			9 159	373				
Henry			53 526	824				
Iriquois			32 535	1 118				
Jackson			61 293	590				
Jasper			11 497	496				
Jefferson			38 604	570				
Jersey	20 256	373						
Jo Daviess			23 263	603				
Johnson			10 149	346				
Kane					298 217	524		
Kankakee			99 413	678				
Kendall					36 647	322		
Knox			57 954	720				
Lake					465 841	454		
La Salle			108 455	1 139				
Lawrence			18 424	374				
Lee			33 826	725				
Livingston			40 686	1 046				
Logan			30 475	619				
McDonough			36 265	590				

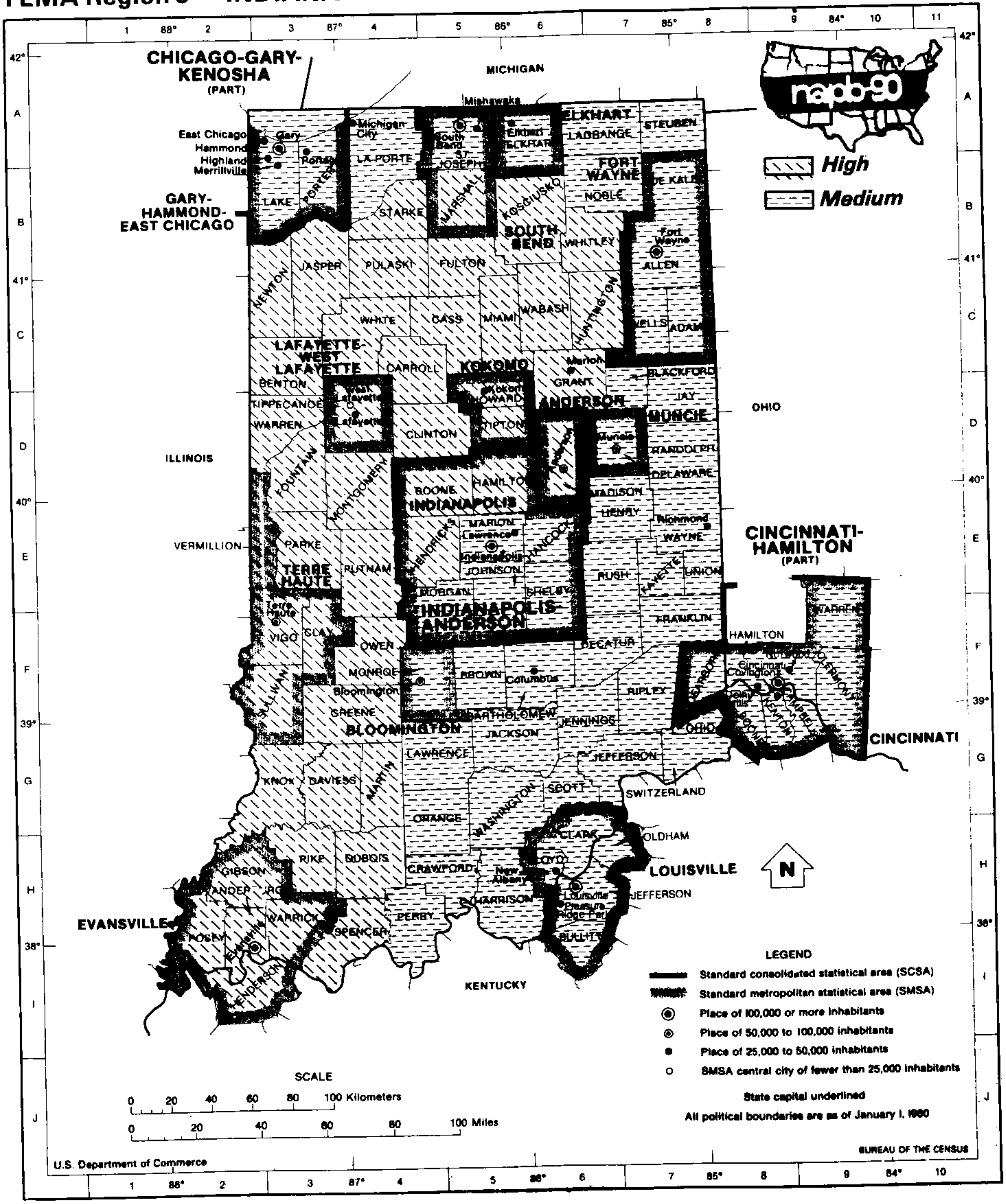
STATE OF ILLINOIS (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
McHenry					158 605	607		
McLean			152 292	1 185				
Macon			127 873	581				
Macoupin	49 374	865						
Madison	247 422	728						
Marion			44 925	573				
Marshall			13 787	388				
Mason			17 943	536				
Massac			14 850	241				
Menard			11 674	315				
Mercer			19 385	559				
Monroe	21 041	388						
Montgomery			32 096	705				
Morgan			37 146	568				
Moultrie			14 598	325				
Ogle			45 687	759				
Peoria			191 238	620				
Perry			22 442	442				
Piatt			16 400	439				
Pike	18 603	830						
Pope			4 345	374				
Pulaski			8 556	203				
Putnam			6 199	160				
Randolph	35 699	583						
Richland			18 653	360				
Rock Island			164 903	423				
St Clair	267 819	672						
Saline			28 808	385				
Sangamon			179 013	806				
Schuyler			8 028	436				

STATE OF ILLINOIS (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Scott	5 978	251						
Shelby			23 698	747				
Stark			6 878	288				
Stephenson					49 795	564		
Tazewell			128 870	650				
Union			18 287	414				
Vermilion			92 625	900				
Wabash			14 342	224				
Warren			21 014	543				
Washington	15 168	563						
Wayne			18 799	715				
White			18 279	497				
Whiteside					63 783	682		
Will					334 477	844		
Williamson			59 035	427				
Winnebago					249 453	515		
Woodford			33 211	527				
TOTAL STATE	812 787	7 676	3 000 057	41 189	7 744 412	6 723	---	---

FEMA Region 5 — INDIANA — *Potential Fallout*



S T A T E O F I N D I A N A -- F A L L O U T R I S K

Estimated 1985 Population: 5,499,636
Land Area: 35,963 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Adams					29 889	340		
Allen					287 909	659		
Bartholomew					64 218	409		
Benton			10 004	407				
Blackford					15 552	166		
Boone			39 948	424				
Brown					12 489	312		
Carroll			19 420	372				
Cass			39 602	414				
Clark					89 700	376		
Clay			24 189	360				
Clinton			31 984	405				
Crawford					9 847	307		
Daviess			29 889	432				
Dearborn					37 278	307		
Decatur					24 060	373		
De Kalb					32 482	364		
Delaware					122 300	392		
Dubois			35 783	429				
Elkhart					143 394	466		
Fayette					27 786	215		
Floyd					63 461	150		
Fountain			18 929	398				
Franklin					21 208	385		
Fulton			18 858	369				

STATE OF INDIANA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Gibson			34 621	490				
Grant			78 305	415				
Greene			30 483	546				
Hamilton			90 684	398				
Hancock					44 449	307		
Harrison					28 777	486		
Hendricks			73 600	409				
Henry					49 438	395		
Howard			84 640	293				
Huntington			34 915	366				
Jackson					37 924	514		
Jasper			26 785	561				
Jay					21 544	384		
Jefferson					30 439	363		
Jennings					22 737	378		
Johnson					82 426	321		
Knox			43 254	520				
Kosciusko			62 293	540				
LaGrange					28 018	380		
Lake					500 016	501		
La Porte					106 674	600		
Lawrence					41 069	452		
Madison			132 788	453				
Marion					777 116	396		
Marshall			40 965	444				
Martin			10 811	339				
Miami			36 512	369				
Monroe					101 351	385		
Montgomery			35 828	505				
Morgan					53 958	409		

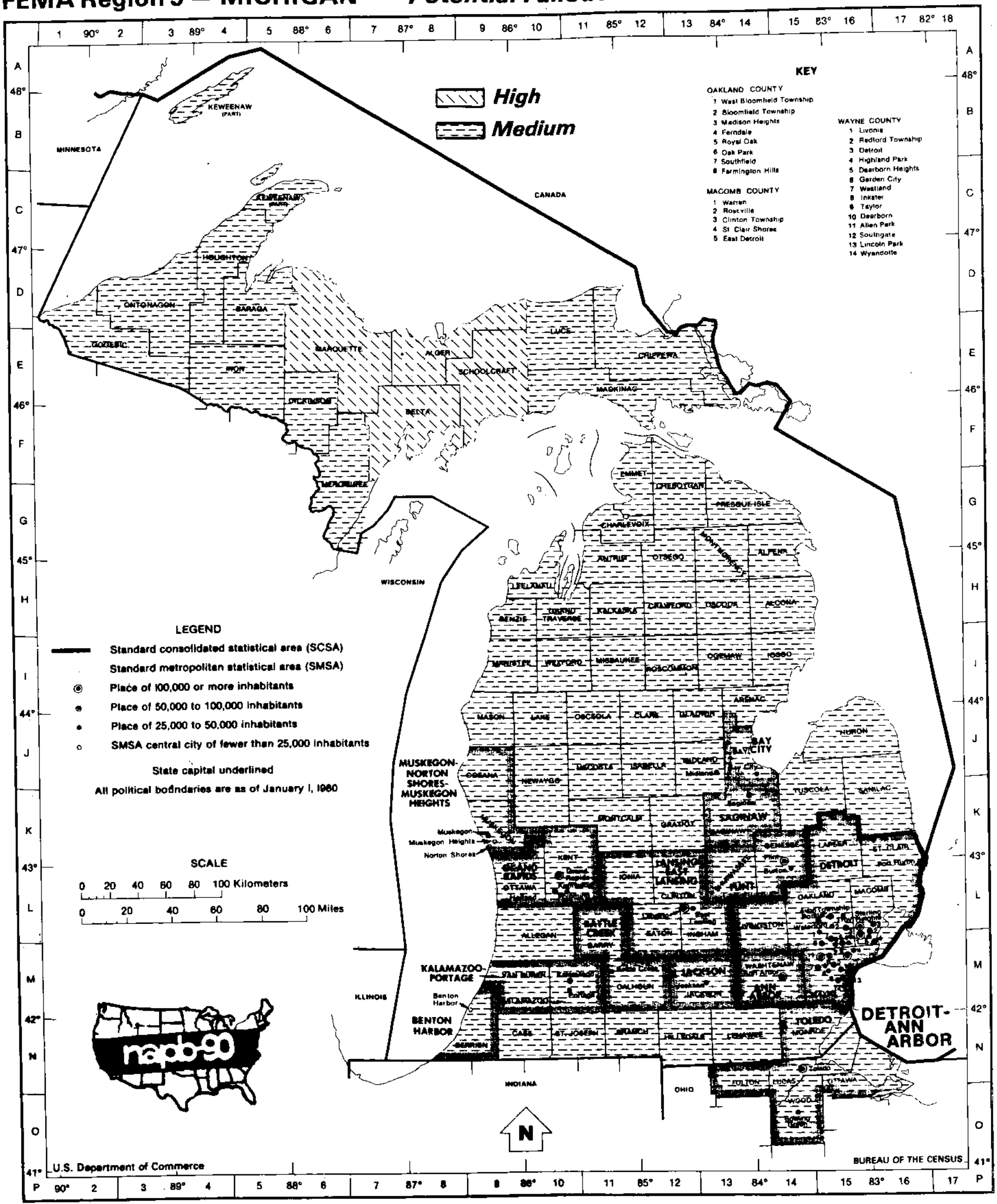
STATE OF INDIANA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Newton			14 572	401				
Noble					36 347	413		
Ohio					5 153	87		
Orange					18 661	408		
Owen			16 529	386				
Parke			16 845	444				
Perry			19 057	381				
Pike			13 173	341				
Porter					126 246	419		
Posey			26 129	410				
Pulaski			13 458	435				
Putnam			30 660	482				
Randolph					28 234	454		
Ripley					25 250	447		
Rush					18 766	408		
St Joseph					239 263	459		
Scott					20 313	192		
Shelby					40 382	412		
Spencer			21 255	400				
Starke			20 993	309				
Steuben					25 018	308		
Sullivan			20 798	452				
Switzerland					7 626	224		
Tippecanoe			124 393	502				
Tipton			15 688	261				
Union					6 746	163		
Vanderburgh			168 196	263				
Vermillion			17 904	260				
Vigo			109 571	405				
Wabash			34 816	398				

STATE OF INDIANA (Continued)

COUNTY	VERY HIGH RISK POPULATION	 AREA	HIGH RISK POPULATION	 AREA	MEDIUM RISK POPULATION	 AREA	LOW RISK POPULATION	 AREA
Warren			8 969	366				
Warrick			45 743	391				
Washington					22 315	516		
Wayne					72 979	404		
Wells					24 878	370		
White			23 599	506				
Whitley			26 512	336				
TOTAL STATE	---	---	1 873 950	18 787	3 625 686	17 176	---	---

FEMA Region 5 — MICHIGAN — *Potential Fallout*



STATE OF MICHIGAN -- FALLOUT RISK

Estimated 1985 Population: 9,030,778
Land Area: 57,019 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	VERY HIGH RISK [GT 15000R] AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	HIGH RISK [EQ/GT 6000R LT 15000R] AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	MEDIUM RISK [EQ/GT 3000R LT 6000R] AREA	LOW RISK [LT 3000R] POPULATION	LOW RISK [LT 3000R] AREA
Alcona					9 865	679		
Alger			8 715	912				
Allegan					84 857	832		
Alpena					31 164	568		
Antrim					16 919	480		
Arenac					15 260	368		
Baraga					8 276	901		
Barry					46 620	560		
Bay					116 484	447		
Benzie					11 105	322		
Berrien					160 914	576		
Branch					38 324	508		
Calhoun					136 813	712		
Cass					47 369	496		
Charlevoix					19 648	421		
Cheboygan					20 952	720		
Chippewa					28 740	1 590		
Clare					24 955	570		
Clinton					55 108	573		
Crawford					9 904	559		
Delta			39 551	1 173				
Dickinson					25 983	770		
Eaton					89 510	579		
Emmet					23 747	468		
Genesee					430 014	642		

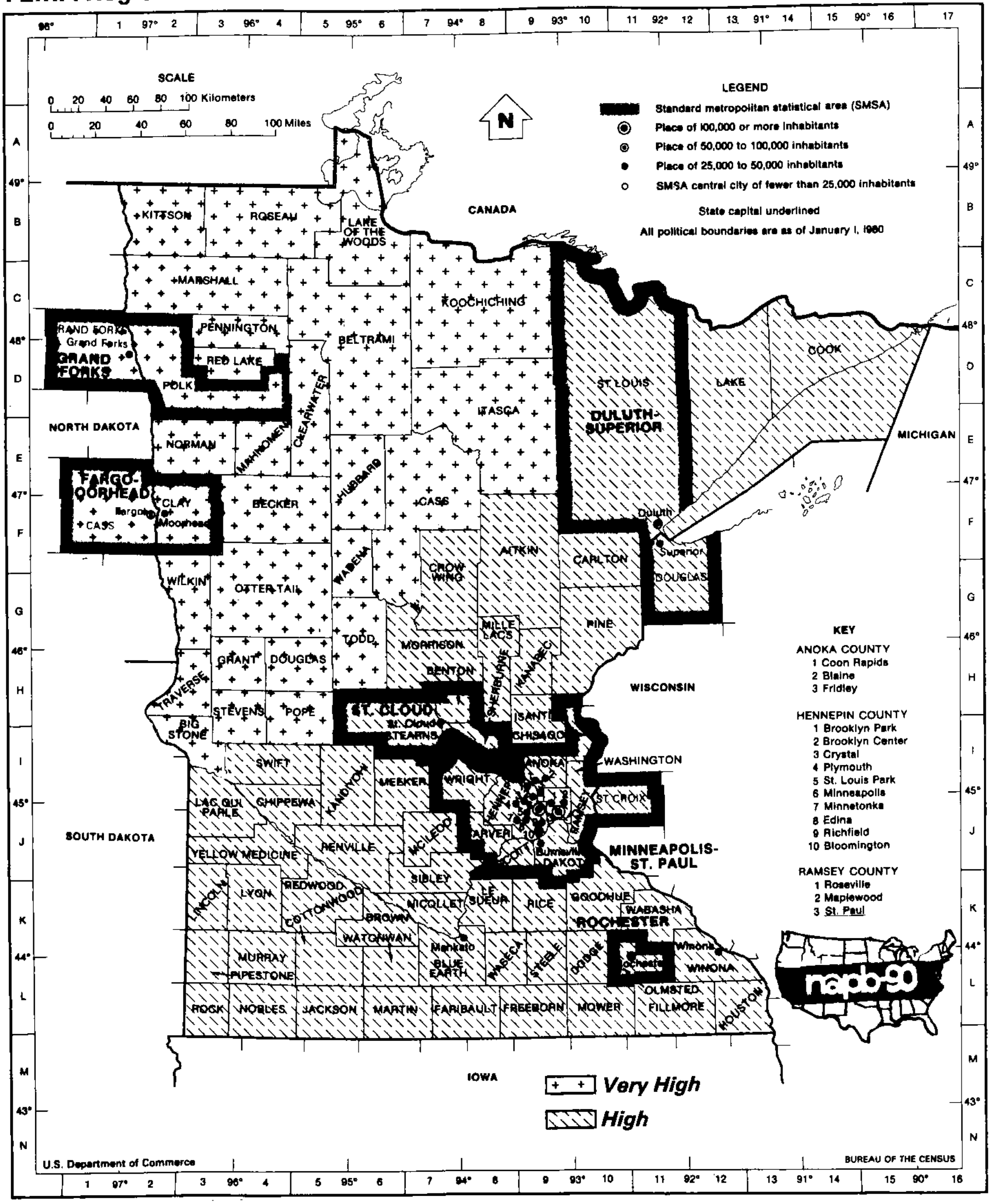
STATE OF MICHIGAN (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Gladwin					21 607	505		
Gogebic					19 217	1 105		
Grand Traverse					57 547	466		
Gratiot					39 574	570		
Hillsdale					41 565	603		
Houghton					38 148	1 014		
Huron					35 867	830		
Ingham					270 681	560		
Ionia					52 503	577		
Iosco					30 680	546		
Iron					14 100	1 163		
Isabella					54 659	576		
Jackson					143 728	705		
Kalamazoo					215 916	562		
Kalkaska					11 623	563		
Kent					465 963	862		
Keweenaw					2 096	544		
Lake					8 593	568		
Lapeer					68 766	658		
Leelanau					14 462	341		
Lenawee					87 729	753		
Livingston					100 690	575		
Luce					5 790	905		
Mackinac					10 241	1 025		
Macomb					684 008	483		
Manistee					22 152	543		
Marquette			71 997	1 882				
Mason					26 439	495		
Mecosta					37 282	560		
Menominee					25 896	1 045		

STATE OF MICHIGAN (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Midland					76 114	525		
Missaukee					10 689	565		
Monroe					130 040	557		
Montcalm					50 284	713		
Montmorency					7 813	550		
Muskegon					155 184	507		
Newaygo					36 547	847		
Oakland					1 003 070	875		
Oceana					21 979	541		
Ogemaw					17 661	569		
Ontonagon					9 630	1 311		
Osceola					20 422	569		
Oscoda					6 914	568		
Otsego					15 421	516		
Ottawa					166 497	567		
Presque Isle					13 781	656		
Roscommon					18 544	528		
Saginaw					216 774	815		
St Clair					137 706	734		
St Joseph					58 102	503		
Sanilac					39 937	964		
Schoolcraft			8 415	1 173				
Shiawassee					67 929	541		
Tuscola					54 830	812		
Van Buren					66 432	612		
Washtenaw					265 283	710		
Wayne					2 148 063	615		
Wexford					26 401	566		
TOTAL STATE	---	---	128 678	5 140	8 902 100	51 879	---	---

FEMA Region 5 — MINNESOTA — *Potential Fallout*



STATE OF MINNESOTA -- FALLOUT RISK

Estimated 1985 Population: 4,181,231
Land Area: 79,547 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Aitkin	....		13 615	1 834				
Anoka	....		214 648	430				
Becker	29 238	1 312						
Beltrami	33 755	2 507						
Benton	....		26 710	408				
Big Stone	7 694	497						
Blue Earth	....		51 263	749				
Brown	....		28 437	610				
Carlton	....		30 176	864				
Carver	....		39 822	351				
Cass	21 799	2 033						
Chippewa	....		14 480	584				
Chisago	....		28 024	417				
Clay	48 492	1 049						
Clearwater	8 958	1 000						
Cook	....		4 068	1 412				
Cottonwood	....		14 015	640				
Crow Wing	....		43 714	1 008				
Dakota	....		218 358	575				
Dodge	....		15 445	439				
Douglas	29 249	644						
Fairbault	....		18 552	714				
Fillmore	....		21 505	862				
Freeborn	....		35 034	705				
Goodhue	....		39 373	763				

STATE OF MINNESOTA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Grant	6 899	547						
Hennepin	....		969 049	541				
Houston	....		18 852	564				
Hubbard	14 427	936						
Isanti	....		25 121	440				
Itasca	42 784	2 661						
Jackson	....		13 471	699				
Kanabec	....		12 663	527				
Kandiyohi	....		38 440	784				
Kittson	6 467	1 104						
Koochiching	16 344	3 108						
Lac Qui Parle	....		10 177	772				
Lake	....		11 624	2 053				
Lake of the Wood	3 775	1 296						
Le Sueur	....		23 743	446				
Lincoln	....		7 811	539				
Lyon	....		25 402	714				
McLeod	....		30 687	489				
Mahnomen	5 369	559						
Marshall	12 456	1 760						
Martin	....		24 921	706				
Meeker	....		21 191	624				
Mille Lacs	....		18 965	578				
Morrison	....		30 289	1 124				
Mower	....		39 199	711				
Murray	....		10 926	702				
Nicollet	....		27 475	440				
Nobles	....		21 185	714				
Norman	8 628	877						
Olmsted	....		97 282	655				

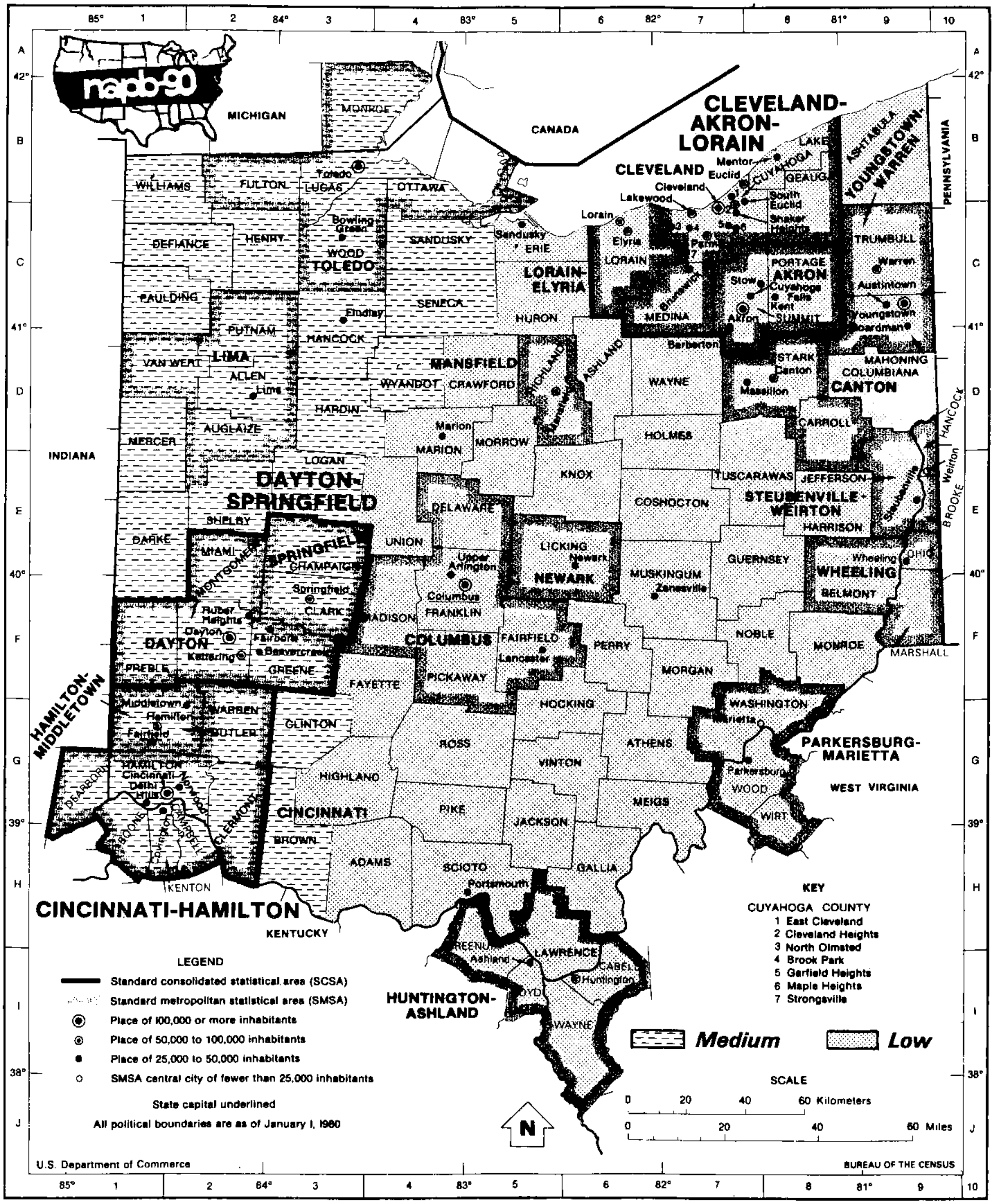
STATE OF MINNESOTA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Otter Tail	52 568	1 973						
Pennington	13 745	618						
Pine	....		21 028	1 421				
Pipestone	....		11 155	466				
Polk	33 479	1 981						
Pope	11 767	668						
Ramsey	....		469 833	154				
Red Lake	5 145	433						
Redwood	....		19 036	881				
Renville	....		19 875	984				
Rice	....		47 643	501				
Rock	....		10 482	483				
Roseau	12 588	1 677						
St Louis	....		206 555	6 125				
Scott	....		47 955	357				
Sherburne	....		33 369	435				
Sibley	....		15 312	593				
Stearns	....		113 166	1 338				
Steele	....		29 841	431				
Stevens	10 574	560						
Swift	....		12 526	742				
Todd	25 886	941						
Traverse	5 391	575						
Wabasha	....		19 538	537				
Wadena	13 856	537						
Waseca	....		18 502	422				
Washington	....		125 448	390				
Watonwan	....		12 366	435				
Wilkin	7 996	751						
Winona	....		46 636	630				

STATE OF MINNESOTA (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
Wright	....		62 769	672				
Yellow Medicine	....		13 155	759				
TOTAL STATE	489 329	32 604	3 691 902	46 943	---	---	---	---

FEMA Region 5 — OHIO — *Potential Fallout*



STATE OF OHIO -- FALLOUT RISK

Estimated 1985 Population: 10,638,633
Land Area: 41,006 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Adams							24 825	586
Allen					108 246	405		
Ashland							46 416	424
Ashtabula							100 965	703
Athens							58 385	508
Auglaize					43 248	398		
Belmont							81 529	537
Brown					33 844	493		
Butler					267 089	465		
Carroll							27 213	393
Champaign					33 387	429		
Clark					146 853	398		
Clermont					138 508	456		
Clinton					34 895	410		
Columbiana							11 603	534
Coshocton							36 487	566
Crawford							48 719	403
Cuyahoga							1 451 046	459
Darke					53 525	606		
Defiance							38 008	414
Delaware							58 142	443
Erie							77 447	264
Fairfield							96 335	506
Fayette							27 400	405
Franklin							899 877	542

STATE OF OHIO (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Fulton					38 575	407		
Gallia							30 092	471
Geauga							75 013	408
Greene					129 410	415		
Guernsey							41 304	522
Hamilton					861 633	412		
Hancock					64 917	532		
Hardin					31 387	471		
Harrison							16 159	400
Henry					28 187	415		
Highland							34 376	553
Hocking							24 746	423
Holmes							30 289	424
Huron							55 072	495
Jackson							29 753	420
Jefferson							86 780	410
Knox							47 613	529
Lake							216 175	231
Lawrence							62 576	456
Licking							124 764	686
Logan					39 597	458		
Lorain							270 340	495
Lucas					462 017	341		
Madison							34 949	467
Mahoning							279 136	417
Marion							66 049	403
Medina							116 655	422
Meigs							23 696	432
Mercer					38 647	457		
Miami							88 976	410

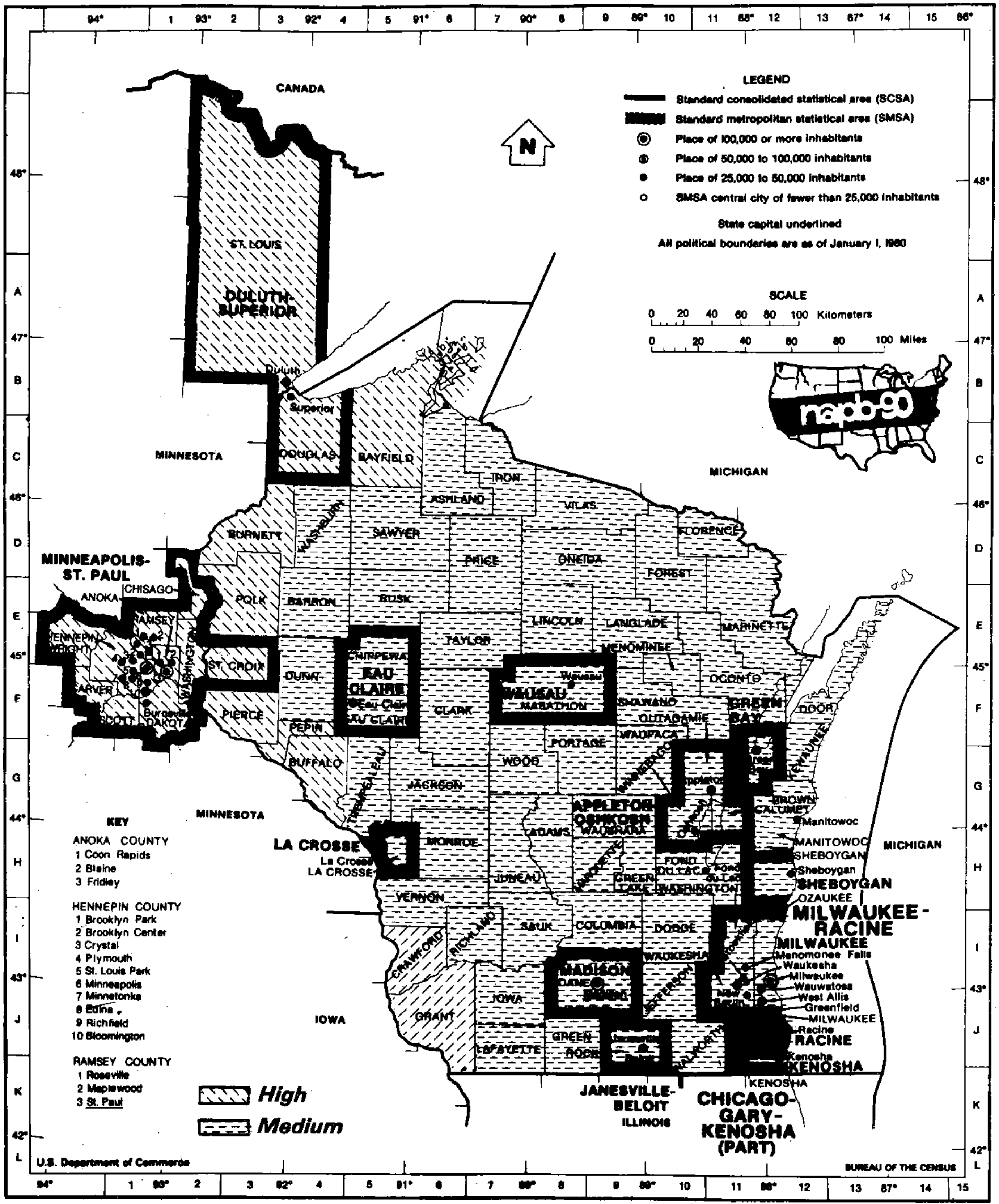
STATE OF OHIO (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Monroe							16 091	458
Montgomery					561 738	458		
Morgan							14 056	420
Morrow							26 564	406
Muskingum							84 376	654
Noble							11 231	399
Ottawa					39 633	253		
Paulding					20 507	419		
Perry							31 855	412
Pickaway							42 544	503
Pike							24 296	443
Portage							137 910	493
Preble					38 517	426		
Putnam					33 276	484		
Richland							128 552	497
Ross							68 139	692
Sandusky					61 918	409		
Scioto							84 422	614
Seneca					61 233	553		
Shelby					43 360	409		
Stark							376 852	574
Summit							509 599	412
Trumbull							235 536	612
Tuscarawas							85 576	569
Union							31 017	437
Van Wert					29 833	410		
Vinton							11 473	414
Warren					103 313	403		
Washington							64 922	640
Wayne							100 270	557

STATE OF OHIO (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Williams					36 158	422		
Wood					108 636	619		
Wyandot					22 355	406		
TOTAL STATE	---	---	---	---	3 714 442	13 639	6 924 191	27 367

FEMA Region 5 — WISCONSIN — Potental Fallout



STATE OF WISCONSIN -- FALLOUT RISK

Estimated 1985 Population: 4,779,553
Land Area: 54,424 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Adams					13 859	648		
Ashland					17 248	1 048		
Barron					39 553	865		
Bayfield			14 400	1 462				
Brown					182 756	524		
Buffalo			14 572	699				
Burnett			13 869	818				
Calumet					33 511	326		
Chippewa					53 660	1 017		
Clark					34 020	1 218		
Columbia					44 916	771		
Crawford			16 679	566				
Dane					335 264	1 205		
Dodge					76 135	887		
Door					26 236	492		
Douglas			43 876	1 305				
Dunn					34 908	853		
Eau Claire					83 603	638		
Florence					4 025	486		
Fond du Lac					89 789	725		
Forest					9 364	1 011		
Grant					51 842	1 144		
Green			30 446	583				
Green Lake					19 281	357		
Iowa					20 743	760		

STATE OF WISCONSIN (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Iron					6 280	751		
Jackson					16 607	998		
Jefferson					66 968	562		
Juneau					21 336	774		
Kenosha					120 916	273		
Kewaunee					20 184	343		
La Crosse					93 613	457		
LaFayette					17 175	634		
Langlade					20 122	873		
Lincoln					28 174	886		
Manitowoc					83 201	594		
Marathon					112 970	1 559		
Marinette					40 352	1 395		
Marquette					12 737	454		
Menominee					3 832	359		
Milwaukee					951 403	241		
Monroe					36 025	904		
Oconto					30 044	1 002		
Oneida					31 238	1 130		
Outagamie					133 891	642		
Ozaukee					67 465	235		
Pepin			7 643	231				
Pierce			32 390	576				
Polk			34 191	919				
Portage					57 011	810		
Price					16 777	1 256		
Racine					173 954	334		
Richland					17 627	585		
Rock					138 419	724		
Rusk					16 110	913		

STATE OF WISCONSIN (Continued)

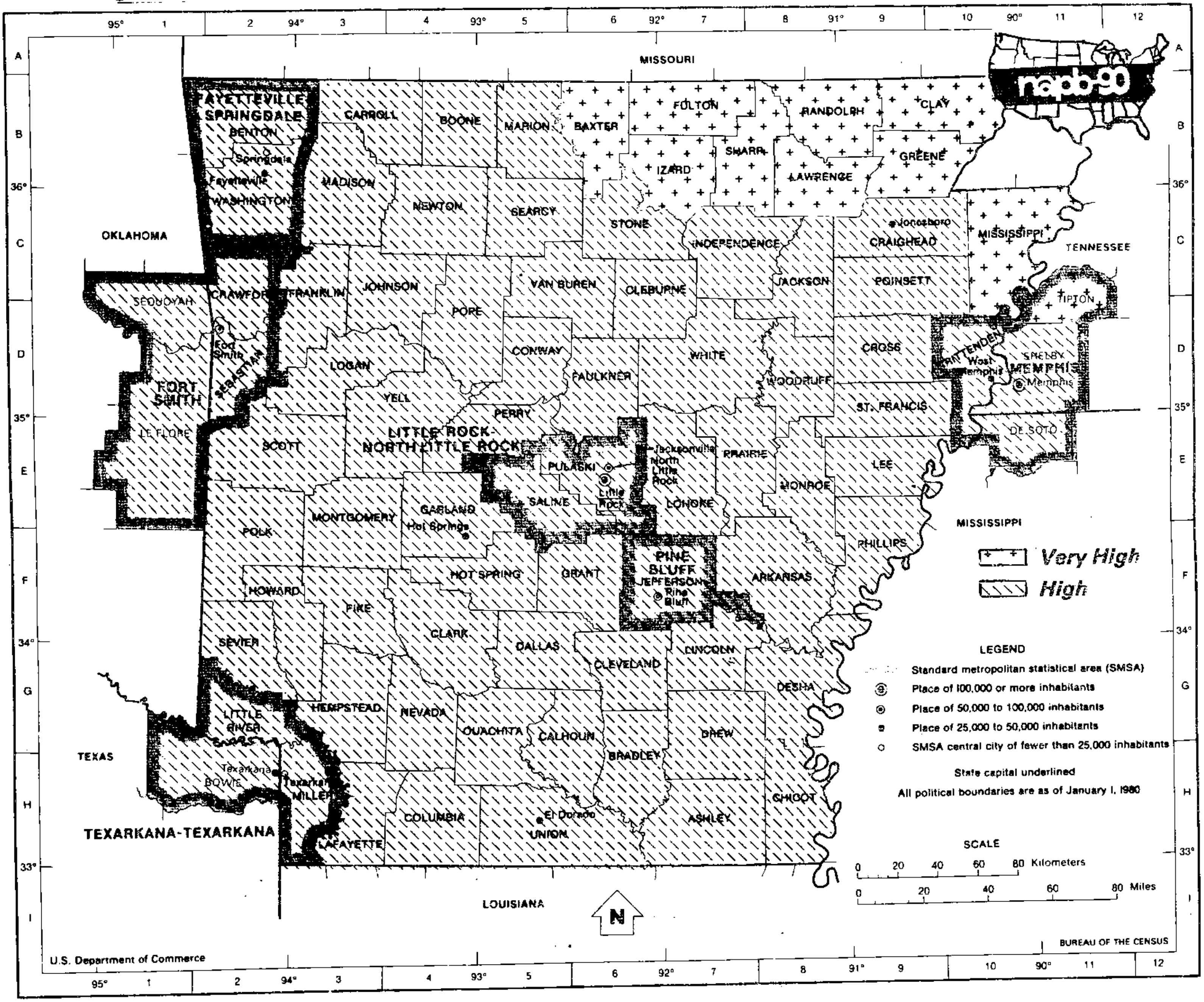
COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
St Croix			45 277	723				
Sauk					44 873	838		
Sawyer					14 310	1 255		
Shawano					36 820	897		
Sheboygan					102 389	515		
Taylor					18 660	975		
Trempealeau					26 132	736		
Vernon					26 772	808		
Vilas					17 750	867		
Walworth					70 757	556		
Washburn					13 767	815		
Washington					87 947	431		
Waukesha					286 077	554		
Waupaca					43 959	754		
Waushara					19 321	628		
Winnebago					133 994	449		
Wood					77 538	801		
TOTAL STATE	---	---	253 343	7 882	4 526 210	46 542	---	---

FEMA REGION VI -- FALLOUT RISK SUMMARY

Estimated 1985 Population: 28,140,362
Land Area: 548,583 square miles

	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
STATE	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Arkansas	240 621	6 294	2 123 020	45 788	---	---	---	---
Louisiana	---	---	902 197	13 964	520 327	9 614	3 102 495	20 942
New Mexico	---	---	60 404	6 066	184 826	12 435	1 215 553	102 835
Oklahoma	72 601	2 661	1 666 762	30 051	1 625 556	35 944	---	---
Texas	---	---	126 824	2 882	4 188 147	45 076	12 111 029	214 031
TOTAL REGION VI	313 222	8 955	4 879 207	98 751	6 518 856	103 069	16 429 077	337 808

FEMA Region 6 — ARKANSAS — *Potential Fallout*



STATE OF ARKANSAS -- FALLOUT RISK

Estimated 1985 Population: 2,363,641
Land Area: 52,082 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	VERY HIGH RISK [GT 15000R] AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	HIGH RISK [EQ/GT 6000R LT 15000R] AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	MEDIUM RISK [EQ/GT 3000R LT 6000R] AREA	LOW RISK [LT 3000R] POPULATION	LOW RISK [LT 3000R] AREA
Arkansas	....		24 025	1 006				
Ashley	....		26 615	934				
Baxter	30 117	546						
Benton	....		86 071	844				
Boone	28 115	584						
Bradley	....		13 434	654				
Calhoun	....		6 162	629				
Carroll	....		17 597	634				
Chicot	....		18 017	649				
Clark	....		23 166	867				
Clay	19 819	641						
Cleburne	....		19 153	551				
Cleveland	....		8 119	599				
Columbia	....		27 495	767				
Conway	....		19 479	558				
Craighead	....		63 470	713				
Crawford	....		40 173	593				
Crittenden	....		50 180	599				
Cross	....		20 753	622				
Dallas	....		11 014	668				
Desha	....		19 698	746				
Drew	....		17 946	831				
Faulkner	....		50 628	646				
Franklin	....		15 588	609				
Fulton	10 449	616						

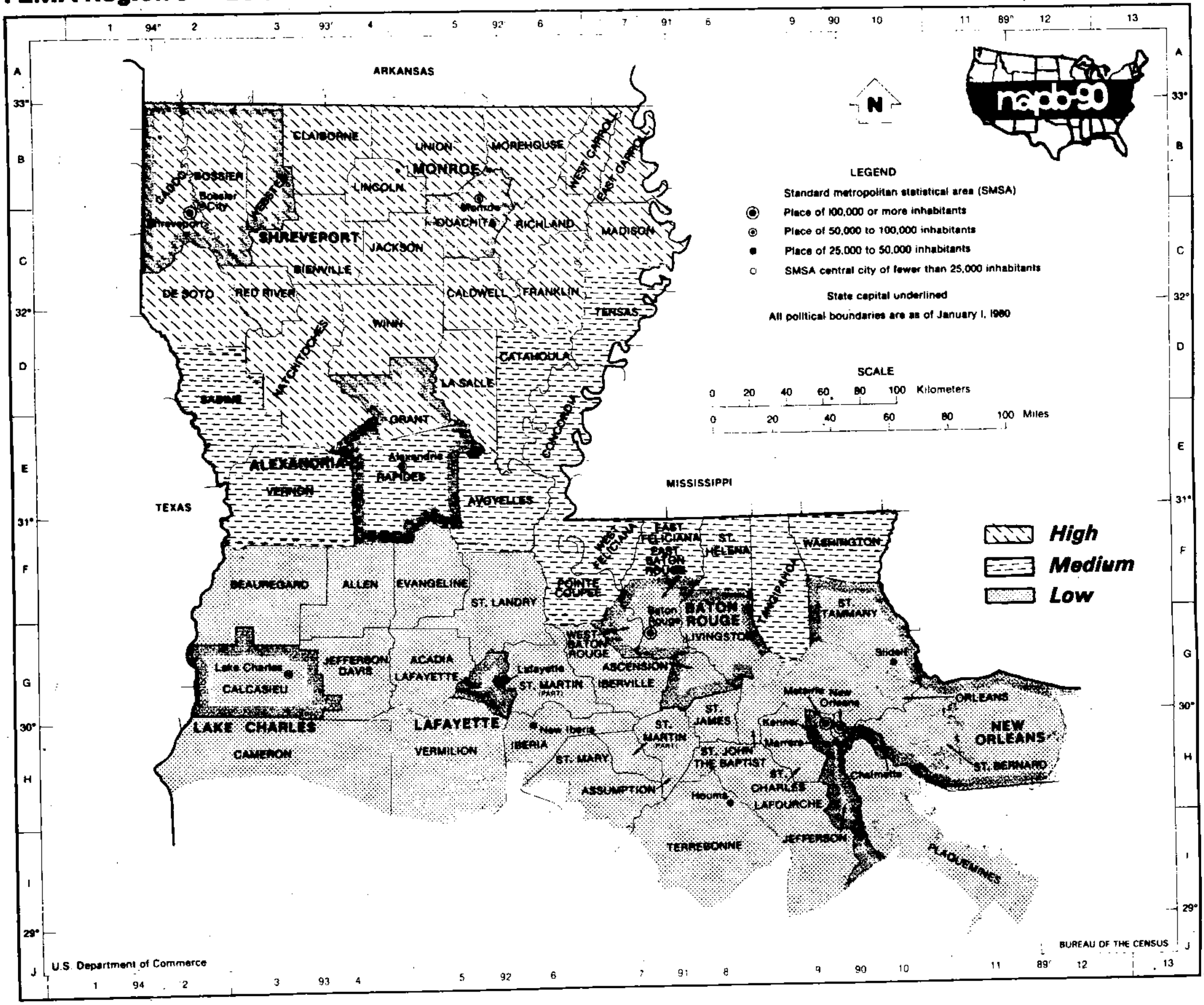
STATE OF ARKANSAS (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Garland	....		74 774	657				
Grant	....		13 183	633				
Greene	31 370	578						
Hempstead	....		23 615	725				
Hot Spring	....		27 264	615				
Howard	....		13 584	574				
Independence	....		32 517	763				
Izard	11 018	581						
Jackson	....		21 479	633				
Jefferson	....		90 496	882				
Johnson	....		18 525	676				
LaFayette	....		10 093	518				
Lawrence	18 546	589						
Lee	....		15 391	602				
Lincoln	....		13 046	563				
Little River	....		14 145	516				
Logan	....		20 662	717				
Lonoke	....		37 233	783				
Madison	....		11 851	837				
Marion	....		12 601	587				
Miller	....		39 656	619				
Mississippi	59 199	897						
Monroe	....		13 383	609				
Montgomery	....		7 782	775				
Nevada	....		10 970	620				
Newton	....		8 207	823				
Ouachita	....		33 443	737				
Perry	....		7 924	551				
Phillips	....		33 653	685				
Pike	....		10 051	598				

STATE OF ARKANSAS (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Poinsett	....		25 939	762				
Polk	....		17 508	860				
Pope	....		42 387	820				
Prairie	....		10 052	656				
Pulaski	....		352 946	767				
Randolph	16 315	656						
St Francis	....		31 547	639				
Saline	....		56 244	725				
Scott	....		9 906	897				
Searcy	....		8 941	668				
Sebastian	....		97 960	535				
Sevier	....		14 471	560				
Sharp	15 673	606						
Stone	....		9 766	606				
Union	....		49 350	1 053				
Van Buren	....		15 337	709				
Washington	....		104 872	951				
White	....		52 827	1 040				
Woodruff	....		10 516	592				
Yell	....		18 140	931				
TOTAL STATE	240 621	6 294	2 123 020	45 788	---	---	---	---

FEMA Region 6 — LOUISIANA — *Potential Fallout*



STATE OF LOUISIANA -- FALLOUT RISK

Estimated 1985 Population: 4,525,019
Land Area: 44,520 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R[		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Acadia							59 861	657
Allen							21 908	766
Ascension							58 862	296
Assumption							23 808	342
Avoyelles					43 773	846		
Beauregard							32 564	1 163
Bienville			16 855	815				
Bossier			90 980	845				
Caddo			276 755	894				
Calcasieu							176 853	1 081
Caldwell			11 466	541				
Cameron							10 180	1 417
Catahoula					12 760	732		
Claiborne			18 483	765				
Concordia					23 966	717		
De Soto			27 693	880				
East Baton Rouge							397 601	458
East Carrol			11 376	426				
East Feliciana					20 727	455		
Evangeline							35 372	667
Franklin			24 409	636				
Grant			18 370	653				
Iberia							70 124	589
Iberville							33 300	637
Jackson			17 125	578				

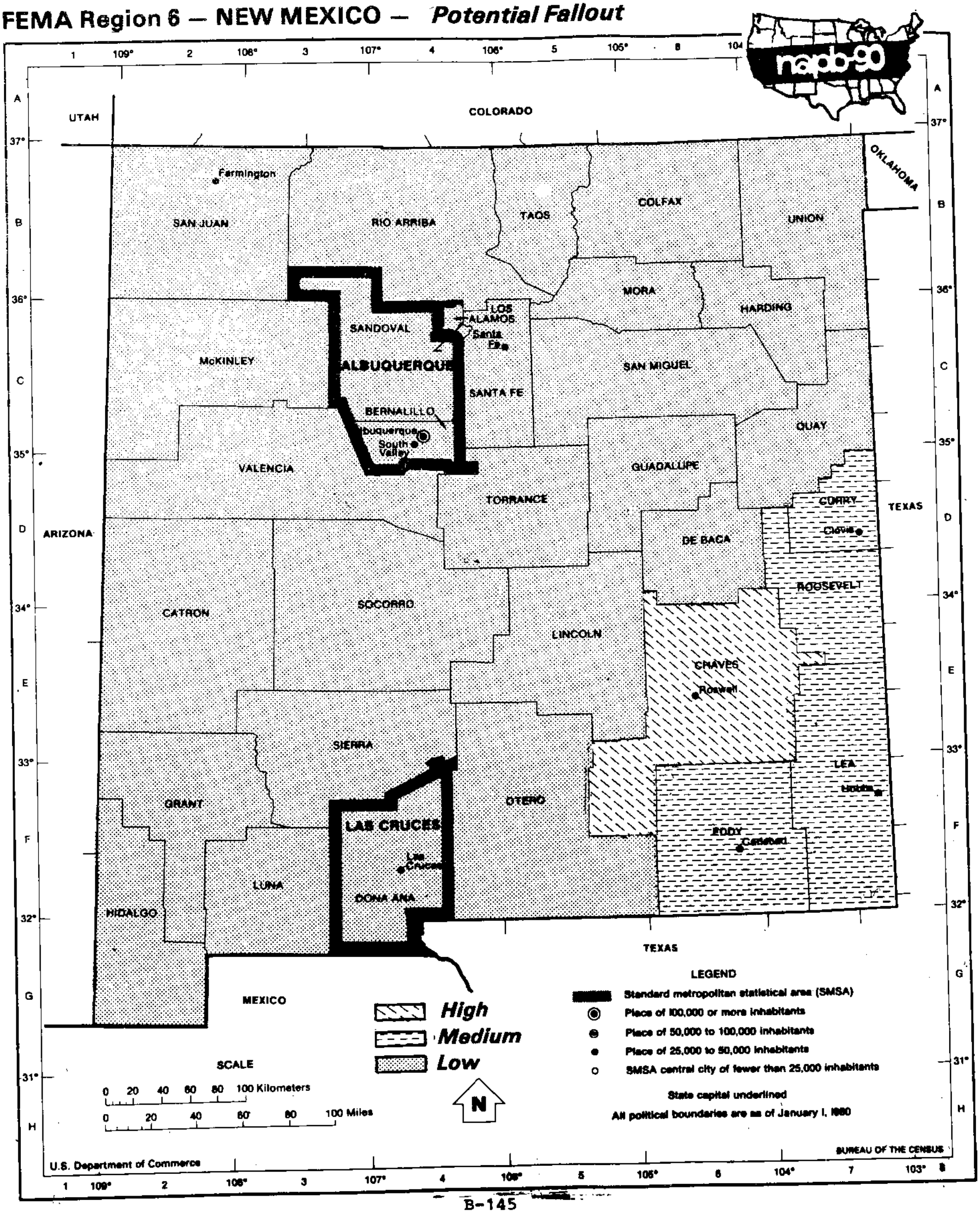
STATE OF LOUISIANA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Jefferson							479 824	347
Jefferson Davis							33 174	655
LaFayette							175 046	270
LaFourche							89 854	1 141
LaSalle			17 629	638				
Lincoln			43 102	472				
Livingston							71 703	661
Madison			15 430	631				
Morehouse			35 796	807				
Natchitoches							40 047	1 264
Orleans							559 384	199
Ouachita			143 485	627				
Plaquemines							26 882	1 035
Pointe Coupee					24 933	566		
Rapides					139 793	1 341		
Red River			10 989	394				
Richland			22 884	563				
Sabine					27 588	855		
St Bernard							68 168	486
St Charles							42 789	286
St Helena					10 406	409		
St James							22 121	248
St John Baptist							41 836	213
St Landry							90 161	936
St Martin							47 258	749
St Mary							65 424	613
St Tammany							142 182	873
Tangipahoa					93 622	783		
Tensas					8 292	623		
Terrebonne							103 873	1 367

STATE OF LOUISIANA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Union			22 551	884				
Vermilion					54 232	1 205		
Vernon								
Washington							62 258	1 332
Webster					46 376	676		
			45 935	602				
West Baton Rouge							20 678	194
West Carroll			13 224	360				
West Feliciana					13 859	406		
Winn			17 660	953				
TOTAL STATE	---	---	902 197	13 964	520 327	9 614	3 102 495	20 942

FEMA Region 6 — NEW MEXICO — *Potential Fallout*



STATE OF NEW MEXICO -- FALLOUT RISK

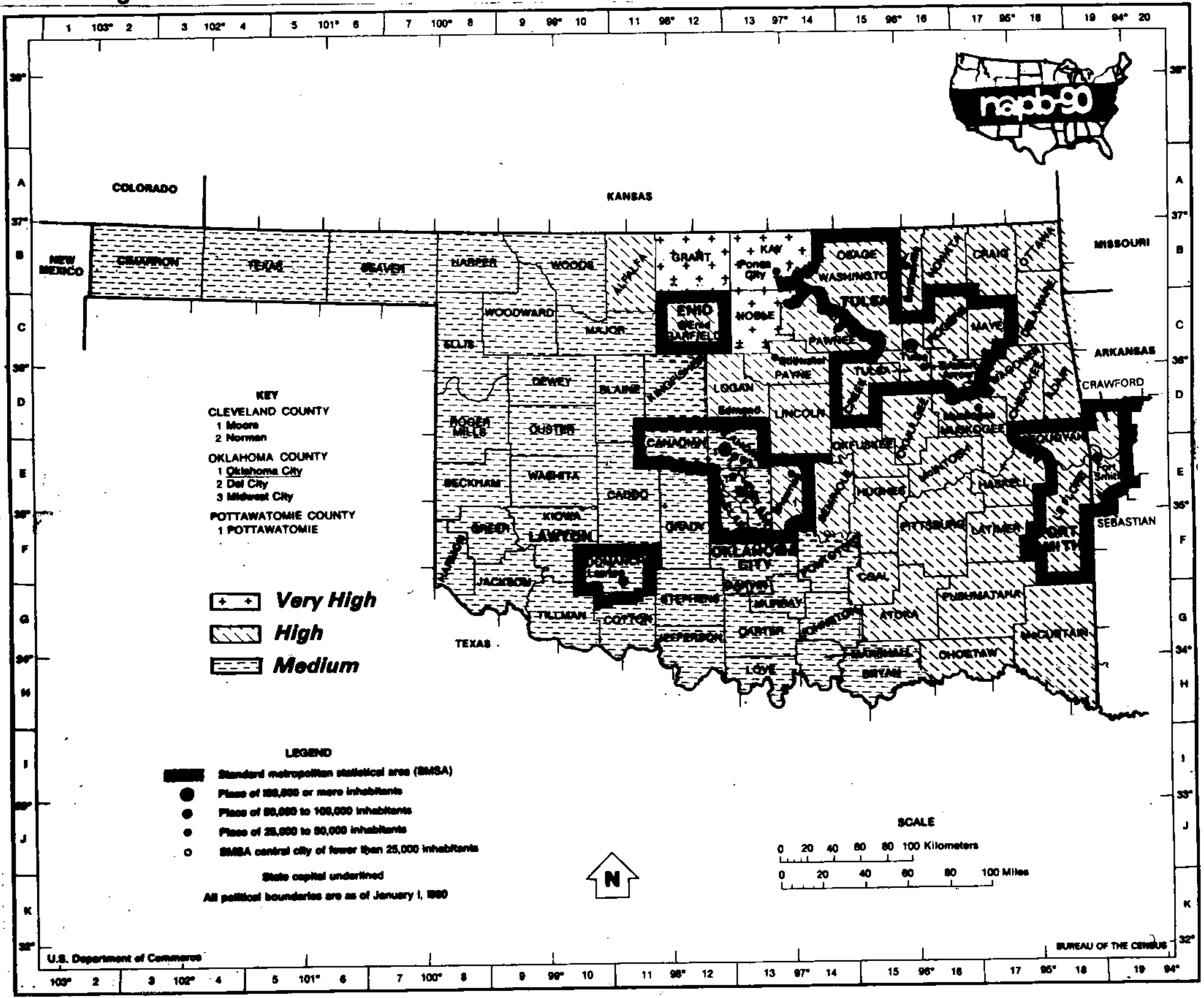
Estimated 1985 Population: 1,460,783
Land Area: 121,336 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R-		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Bernalillo							456 640	1 169
Catron							2 781	6 929
Chaves			60 404	6 066				
Colfax							13 280	3 762
Curry					44 347	1 408		
DeBaca							2 278	2 323
Dona Ana							116 120	3 819
Eddy					55 403	4 184		
Grant							27 992	3 969
Guadalupe							4 448	3 032
Harding							946	2 122
Hidalgo							6 462	3 445
Lea					68 068	4 390		
Lincoln							14 173	4 832
Los Alamos							19 396	109
Luna							16 846	2 965
McKinley							62 558	5 442
Mora							4 909	1 930
Otero							50 681	6 626
Quay							10 634	2 874
Rio Arriba							32 805	5 856
Roosevelt					17 008	2 453		
Sandoval							35 678	3 707
San Juan							99 037	5 522
San Miguel							24 909	4 709

STATE OF NEW MEXICO (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Santa Fe							82 898	1 905
Sierra							9 058	4 178
Socorro							15 027	6 625
Taos							21 094	2 204
Torrance							8 397	3 335
Union							5 531	3 830
Valencia							70 975	5 616
TOTAL STATE	---	---	60 404	6 066	184 826	12 435	1 215 553	102 835

FEMA Region 6 —OKLAHOMA — *Potential Fallout*



STATE OF OKLAHOMA -- FALLOUT RISK

Estimated 1985 Population: 3,364,919
Land Area: 68,656 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Adair			20 474	577				
Alfalfa			7 148	864				
Atoka			13 806	980				
Beaver					7 451	1 808		
Beckham					28 439	904		
Blaine					14 513	920		
Bryan					32 184	902		
Caddo					34 998	1 286		
Canadian					71 951	902		
Carter					47 692	827		
Cherokee			34 575	748				
Choctaw			16 400	763				
Cimarron					4 046	1 842		
Cleveland					160 572	529		
Coal			5 816	520				
Comanche					121 146	1 076		
Cotton					6 987	656		
Craig			15 333	763				
Creek			72 149	930				
Custer					36 008	981		
Delaware			28 310	720				
Dewey					6 721	1 007		
Ellis					6 483	1 232		
Garfield			66 024	1 060				
Garvin					31 029	813		

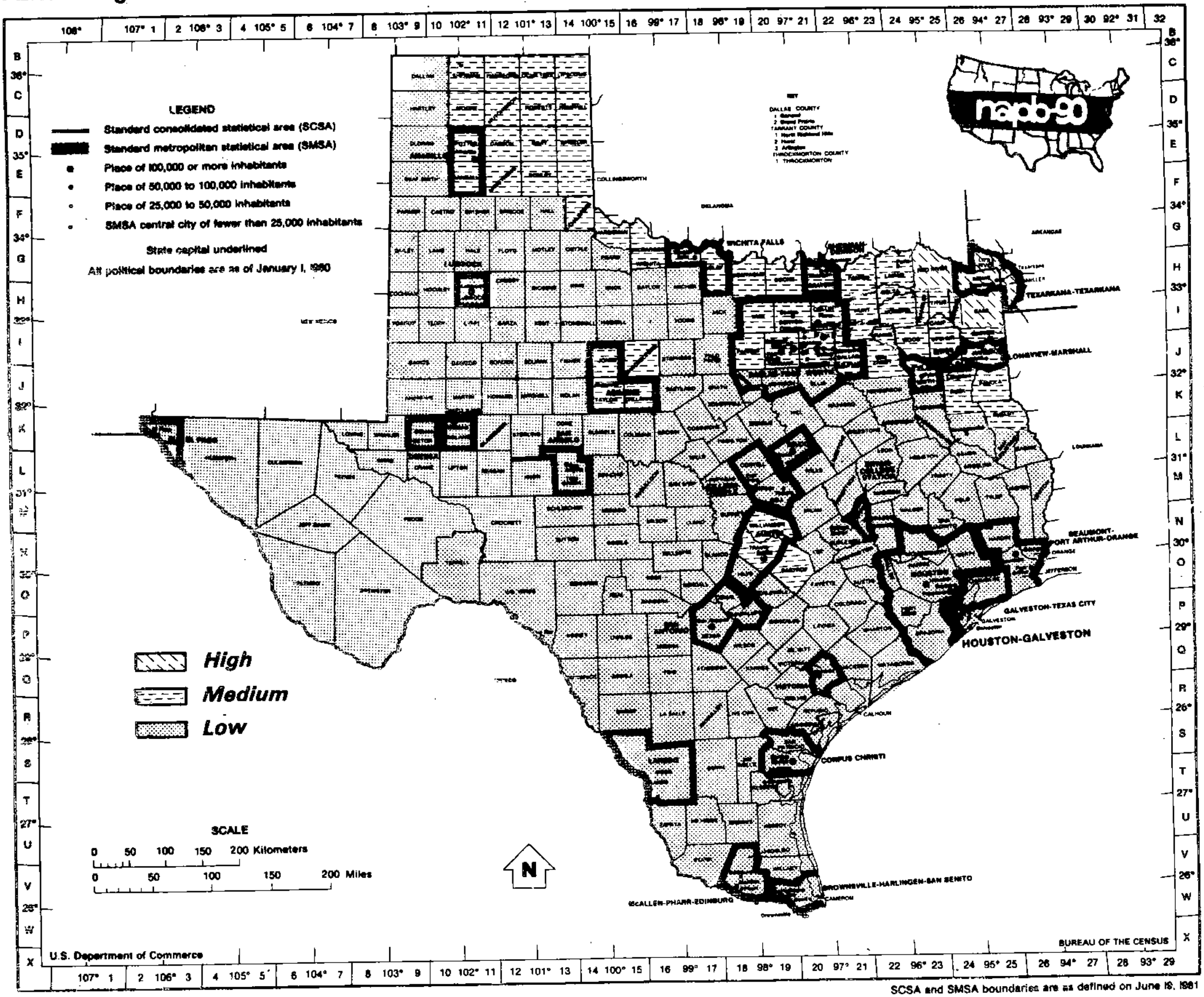
STATE OF OKLAHOMA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Grady					46 202	1 106		
Grant	6 713	1 004						
Greer					7 290	638		
Harmon					4 422	537		
Harper					4 839	1 039		
Haskell			11 927	570				
Hughes			15 085	805				
Jackson					30 803	817		
Jefferson					8 759	769		
Johnston					10 912	639		
Kay	53 759	921						
Kingfisher					16 877	906		
Kiowa					12 812	1 019		
Latimer			10 152	728				
Le Flore			43 438	1 585				
Lincoln			30 539	964				
Logan			31 357	748				
Love					8 154	519		
McClain					25 247	581		
McCurtain			35 933	1 826				
McIntosh			17 305	599				
Major					9 516	958		
Marshall					11 460	372		
Mayes			35 187	644				
Murray					13 473	420		
Muskogee			70 748	815				
Noble	12 129	736						
Nowata			11 552	541				
Okfuskee			12 082	628				
Oklahoma					635 696	708		

STATE OF OKLAHOMA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Okmulgee			40 403	698				
Osage			42 658	2 264				
Ottawa			33 882	465				
Pawnee			17 176	551				
Payne			65 992	691				
Pittsburg			43 109	1 251				
Pontotoc					34 762	717		
Pottawatomie			62 945	783				
Pushmataha			11 880	1 417				
Roger Mills					6 385	1 146		
Rogers			56 007	683				
Seminole			29 055	639				
Sequoyah			33 645	678				
Stephens					46 259	885		
Texas					18 201	2 040		
Tillman					11 650	904		
Tulsa			519 654	571				
Wagoner			52 032	559				
Washington			52 984	423				
Washita					17 419	1 006		
Woods					10 827	1 291		
Woodward					23 371	1 242		
TOTAL STATE	72 601	2 661	1 666 762	30 051	1 625 556	35 944	---	---

FEMA Region 6 — TEXAS — *Potential Fallout*


LEGEND
Standard consolidated statistical area (SCSA)
Standard metropolitan statistical area (SMSA)
Place of 100,000 or more inhabitants
Place of 50,000 to 100,000 inhabitants
Place of 25,000 to 50,000 inhabitants
SMSA central city of fewer than 25,000 inhabitants
State capital underlined
All political boundaries are as of January 1, 1980
High
Medium
Low
SCALE
0 50 100 150 200 Kilometers
0 50 100 150 200 Miles
N
nadb-90
KEY
DALLAS COUNTY
2 Grand Prairie
TARRANT COUNTY
1 North Richland Hills
2 Hurst
3 Arlington
THROCKMORTON COUNTY
1 THROCKMORTON
WICHITA FALLS
TEXARKANA-TEXARKANA
LONGVIEW-MARSHALL
BEAUMONT-PORT ARTHUR-ORANGE
JEFFERSON
GALVESTON-TEXAS CITY
HOUSTON-GALVESTON
CALHOUN
CORPUS CHRISTI
BROWNSVILLE-HARLINGEN-SAN BENITO
McALLEN-PHARR-EDINBURG
CAMERON
U.S. Department of Commerce
BUREAU OF THE CENSUS

SCSA and SMSA boundaries are as defined on June 19, 1981

STATE OF TEXAS -- FALLOUT RISK

Estimated 1985 Population: 16,426,000
Land Area: 261,989 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Anderson							47 651	1 077
Andrews							16 609	1 501
Angelina							69 361	807
Aransas							17 801	280
Archer							8 179	907
Armstrong					1 937	910		
Atrascosa							28 715	1 218
Austin							21 150	656
Bailey							8 227	827
Bandera							8 732	793
Bastrop					32 710	895		
Baylor							5 126	862
Bee							29 378	880
Bell							169 465	1 055
Bexar							1 117 869	1 248
Blanco							5 508	714
Borden							1 003	900
Bosque							14 289	989
Bowie			80 151	891				
Brazoria							190 191	1 407
Brazos							123 285	588
Brewster							8 213	6 169
Briscoe							2 266	887
Brooks							9 279	942
Brown							36 336	936

STATE OF TEXAS (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Burleson							15 837	668
Burnet							22 587	994
Caldwell							27 133	546
Calhoun							22 997	540
Callahan					13 009	899		
Cameron							248 893	905
Camp							10 465	203
Carson					7 188	924		
Cass			30 977	937				
Castro							10 177	899
Chambers							20 132	616
Cherokee							39 769	1 052
Childress					6 452	707		
Clay					9 871	1 085		
Cochran							4 732	775
Coke							3 706	908
Coleman							10 468	1 277
Collin					187 101	851		
Collingsworth					4 072	909		
Colorado							20 306	964
Comal							44 827	555
Comanche							13 217	930
Concho							2 977	992
Cooke					29 097	893		
Coryell							58 932	1 057
Cottle							2 633	895
Crane							5 350	782
Crockett							5 035	2 806
Crosby							8 432	898
Culberson							3 509	3 815

STATE OF TEXAS (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Dallam							6 796	1 505
Dallas					1 765 074	880		
Dawson							17 059	903
Deaf Smith							20 205	1 497
Delta					4 944	279		
Denton							174 001	911
De Witt							20 656	910
Dickens							3 090	907
Dimmit							12 065	1 307
Donley					4 208	929		
Duval							13 548	1 795
Eastland							21 466	924
Ector							151 738	903
Edwards							2 168	2 102
Ellis							69 192	939
El Paso							538 075	1 014
Erath							24 905	1 080
Falls							18 274	770
Fannin					24 681	895		
Fayette							20 407	950
Fisher							5 741	897
Floyd							8 802	992
Foard							1 849	703
Fort Bend							191 398	876
Franklin					7 415	294		
Freestone							17 218	888
Frio							14 644	1 133
Gaines							14 581	1 504
Galveston							220 241	399
Garza							5 720	895

STATE OF TEXAS (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Gillespie							15 622	1 061
Glasscock							1 251	900
Goliad							5 897	859
Gonzales							19 081	1 068
Gray					27 503	921		
Grayson					95 891	934		
Gregg					114 058	273		
Grimes							17 968	799
Guadalupe							54 862	713
Hale							37 243	1 005
Hall							4 963	876
Hamilton							8 136	836
Hansford					6 590	921		
Hardeman					6 589	688		
Hardin							44 075	898
Harris							2 831 639	1 734
Harrison					58 471	908		
Hartley							3 633	1 462
Haskell							7 515	901
Hays							51 765	678
Hemphill					6 418	903		
Henderson							52 080	888
Hidalgo							350 518	1 569
Hill							27 335	968
Hockley							24 809	908
Hood							25 815	425
Hopkins					28 369	789		
Houston							23 673	1 234
Howard							38 311	901
Hudspeth							2 620	4 566

STATE OF TEXAS (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Hunt					65 278	840		
Hutchinson					30 287	871		
Irion							1 800	1 052
Jack							7 639	920
Jackson							13 946	844
Jasper							32 469	921
Jeff Davis							1 770	2 258
Jefferson							260 403	937
Jim Hogg							5 464	1 136
Jim Wells							40 710	867
Johnson							85 375	731
Jones					18 960	931		
Karnes					13 498	753		
Kaufman							49 484	788
Kendall							13 788	663
Kenedy							485	1 389
Kent							1 100	878
Kerr							33 638	1 107
Kimble							4 297	1 250
King							430	914
Kinney							2 407	1 359
Kleberg							34 983	853
Knox							5 583	845
Lamar					44 953	919		
Lamb							17 077	1 013
Lampasas							13 753	714
La Salle							5 960	1 517
Lavaca							18 238	971
Lee							14 220	631
Leon							11 710	1 078

STATE OF TEXAS (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Liberty							55 859	1 174
Limestone							21 699	931
Lipscomb					4 310	933		
Live Oak							9 872	1 057
Llano							12 072	939
Loving							75	671
Lubbock							220 637	900
Lynn							7 834	888
McCulloch							8 849	1 071
McLennan							184 912	1 031
McMullen							934	1 163
Madison							12 236	473
Marion					10 734	385		
Martin							5 451	914
Mason							3 526	934
Matagorda							37 618	1 127
Maverick							36 420	1 287
Medina							25 049	1 331
Menard							2 408	902
Midland							121 309	902
Milam							23 556	1 019
Mills							4 590	748
Mitchell							9 286	912
Montague					18 758	928		
Montgomery							168 161	1 047
Moore					17 728	905		
Morris					15 523	256		
Motley							1 820	959
Nacogdoches							51 584	939
Navarro							39 336	1 068

STATE OF TEXAS (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Newton							13 436	935
Nolan							18 011	915
Nueces							305 867	847
Ochiltree					11 484	919		
Oldham							2 436	1 485
Orange							91 432	362
Palo Pinto							26 766	949
Panola					23 148	812		
Parker							54 135	902
Parmer							10 776	885
Pecos							17 658	4 776
Polk							30 680	1 061
Potter					108 666	902		
Presidio							5 405	3 857
Rains					5 979	243		
Randall					85 692	917		
Reagan							5 065	1 173
Real							2 784	697
Red River			15 696	1 054				
Reeves							15 924	2 626
Refugio							9 225	771
Roberts					1 062	915		
Robertson							16 266	864
Rockwall					20 181	128		
Runnels							12 504	1 056
Rusk					44 629	932		
Sabine							9 975	486
San Augustine							8 887	524
San Jacinto							14 075	572
San Patricio							64 171	693

STATE OF TEXAS (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
San Saba							6 003	1 136
Schleicher							3 314	1 309
Scurry							20 589	900
Shackelford					4 096	915		
Shelby					24 040	791		
Sherman					3 235	923		
Smith					148 646	932		
Somervell							4 528	188
Starr							33 795	1 226
Stephens							10 829	894
Sterling							1 641	923
Stonewall							2 466	925
Sutton							5 948	1 455
Swisher							8 860	902
Tarrant							1 047 540	868
Taylor					126 136	917		
Terrell							1 465	2 357
Terry							15 475	886
Throckmorton							2 384	912
Titus					23 389	412		
Tom Green							98 791	1 515
Travis					518 971	989		
Trinity							11 631	692
Tyler							18 854	922
Upshur					33 233	587		
Upton							5 783	1 243
Uvalde							24 016	1 564
Val Verde					41 253	3 150		
Van Zandt							37 028	855
Victoria							75 901	887

STATE OF TEXAS (Continued)

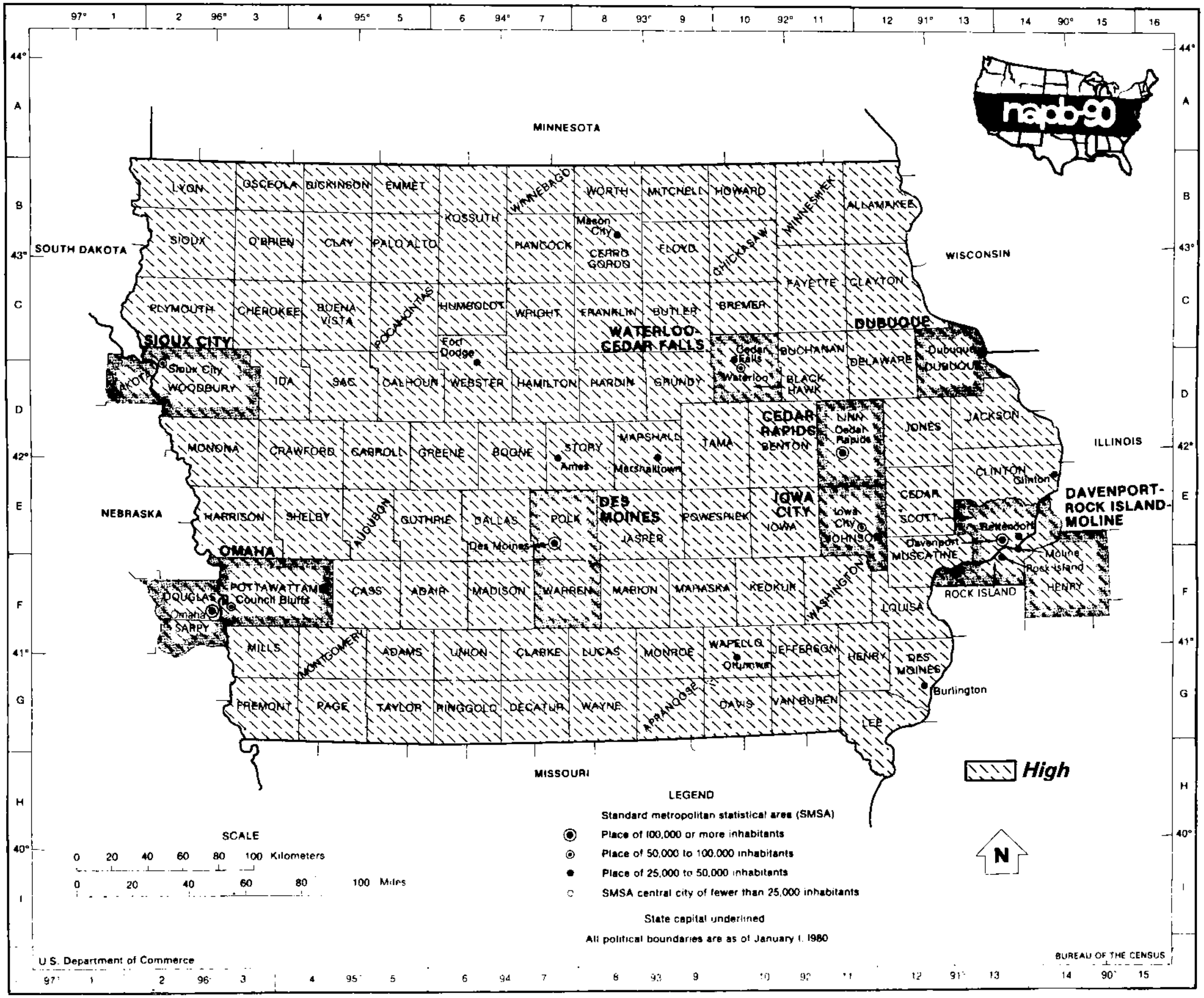
COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Walker							52 221	786
Waller							24 262	514
Ward							16 495	836
Washington							25 426	610
Webb							122 888	3 363
Wharton							41 409	1 086
Wheeler					8 502	905		
Witchita					127 426	606		
Wilbarger					16 904	947		
Willacy							18 857	589
Williamson					101 812	1 137		
Wilson							18 710	807
Winkler							11 236	840
Wise							31 679	902
Wood					27 986	689		
Yoakum							9 654	800
Young							20 063	919
Zapata							8 344	999
Zavala							12 247	1 289
TOTAL STATE	---	---	126 824	2 882	4 188 147	45 076	12 111 029	214 031

FEMA REGION VII -- FALLOUT RISK SUMMARY

Estimated 1985 Population: 11,925,241
Land Area: 282,971 square miles

STATE	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Iowa	---	---	2 906 939	55 964	---	---	---	---
Kansas	1 107 419	39 999	1 259 879	31 295	87 635	10 498	---	---
Missouri	3 339 896	43 945	1 628 662	24 631	---	---	---	---
Nebraska	429 634	56 943	1 185 177	19 696	---	---	---	---
TOTAL REGION VII	4 876 949	140 887	6 980 657	131 586	87 635	10 498	---	---

FEMA Region 7 — IOWA — *Potential Fallout*



STATE OF IOWA -- FALLOUT RISK

Estimated 1985 Population: 2,906,939
Land Area: 55,964 square miles

	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
COUNTY	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Adair	....		9 171	569				
Adams	....		5 535	425				
Allamakee	....		15 188	633				
Appanoose	....		14 710	498				
Audobon	....		8 169	444				
Benton	....		22 898	719				
Black Hawk	....		136 865	573				
Boone	....		25 946	573				
Bremer	....		24 669	439				
Buchanan	....		22 900	572				
Buena Vista	....		21 016	575				
Butler	....		17 310	582				
Calhoun	....		12 866	571				
Carroll	....		22 915	570				
Cass	....		17 077	565				
Cedar	....		18 790	582				
Cerro Goprdo	....		48 580	569				
Cherokee	....		15 621	577				
Chickasaw	....		15 018	505				
Clarke	....		8 787	431				
Clay	....		19 165	569				
Clayton	....		21 245	778				
Clinton	....		55 532	695				
Crawford	....		19 448	714				
Dallas	....		29 750	591				

STATE OF IOWA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Davis	....		9 276	504				
Decatur	....		9 232	535				
Delaware	....		19 169	578				
Des Moines	....		44 964	414				
Dickinson	....		15 710	381				
Dubuque	....		91 209	607				
Emmet	....		12 838	394				
Fayette	....		24 668	731				
Floyd	....		18 980	502				
Franklin	....		12 521	583				
Fremont	....		9 238	515				
Greene	....		11 579	571				
Grundy	....		13 743	501				
Guthrie	....		11 507	590				
Hamilton	....		17 290	576				
Hancock	....		13 559	571				
Hardin	....		21 564	569				
Harrison	....		15 855	698				
Henry	....		18 755	436				
Howard	....		10 877	473				
Humboldt	....		11 972	437				
Ida	....		8 852	432				
Iowa	....		15 135	587				
Jackson	....		22 405	638				
Jasper	....		36 039	731				
Jefferson	....		16 445	440				
Johnson	....		85 664	614				
Jones	....		20 530	576				
Keokuk	....		12 511	580				
Kossuth	....		21 303	974				

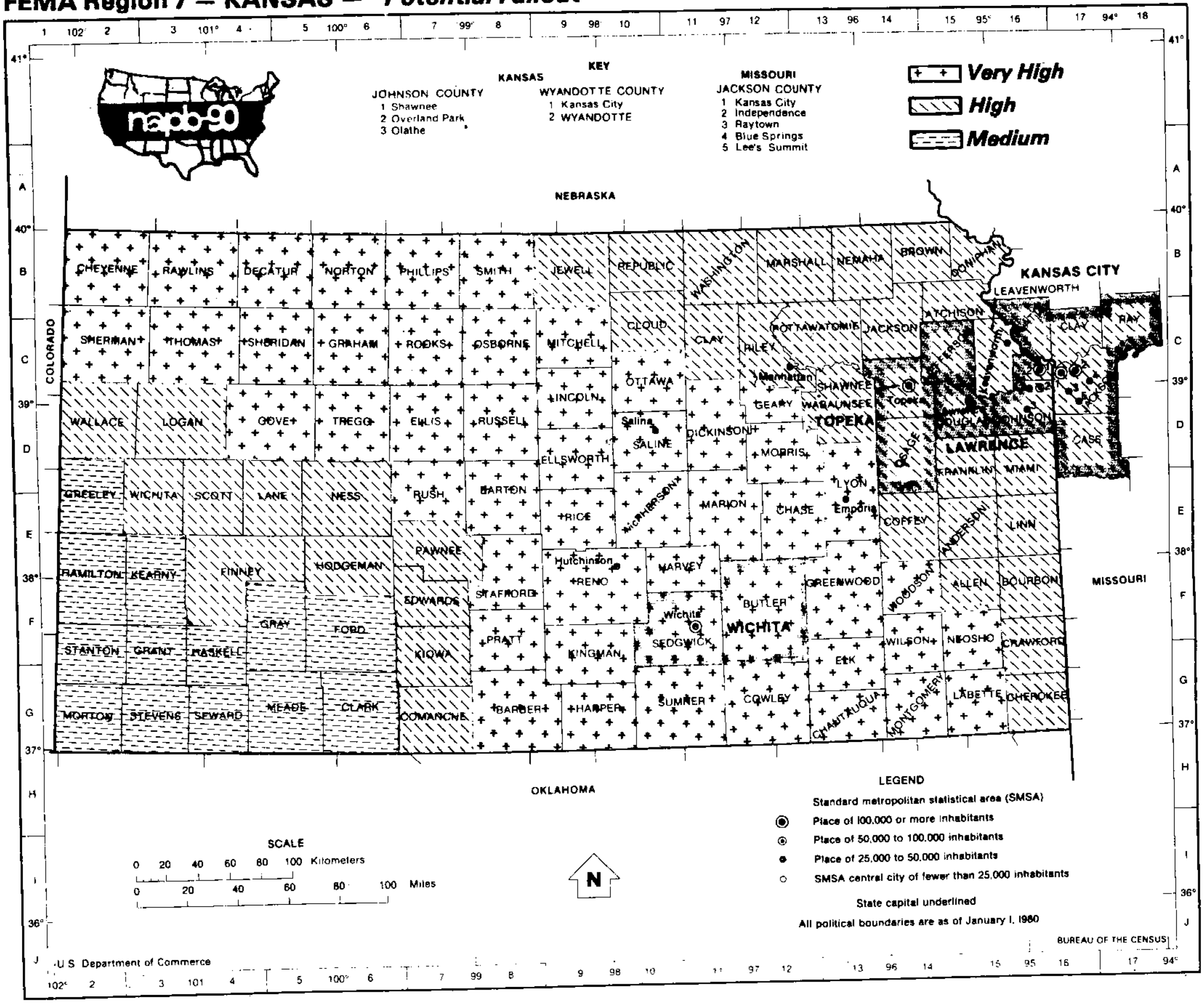
STATE OF IOWA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Lee	....		42 782	522				
Linn	....		169 437	724				
Louisa	....		12 205	402				
Lucas	....		10 127	432				
Lyon	....		12 755	588				
Madison	....		12 297	563				
Mahaska	....		23 124	571				
Marion	....		30 300	560				
Marshall	....		41 544	573				
Mills	....		13 842	439				
Mitchell	....		11 817	469				
Monona	....		11 292	697				
Monroe	....		8 779	434				
Montgomery	....		13 273	424				
Muscatine	....		42 285	442				
OBrien	....		16 817	572				
Osceola	....		8 173	398				
Page	....		18 930	535				
Palo Alto	....		12 148	562				
Plymouth	....		24 479	864				
Pocahontas	....		10 841	577				
Polk	....		313 620	582				
Pottawattamie	....		88 306	953				
Poweshiek	....		18 716	585				
Ringgold	....		5 797	536				
Sac	....		13 394	576				
Scott	....		161 427	459				
Shelby	....		14 675	591				
Sioux	....		31 399	769				
Story	....		73 036	574				

STATE OF IOWA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Tama	....		18 964	722				
Taylor	....		8 297	537				
Union	....		13 855	426				
Van Buren	....		8 281	484				
Wapello	....		39 386	434				
Warren	....		35 956	573				
Washington	....		20 041	570				
Wayne	....		7 837	527				
Webster	....		43 236	718				
Winnebago	....		12 850	401				
Winneshiek	....		22 264	690				
Woodbury	....		101 027	873				
Worth	....		8 906	401				
Wright	....		15 861	578				
TOTAL STATE	---	---	2 906 939	55 964	---	---	---	---

FEMA Region 7 — KANSAS — *Potential Fallout*



STATE OF KANSAS -- FALLOUT RISK

Estimated 1985 Population: 2,454,933
Land Area: 81,792 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Allen			16 160	505				
Anderson			8 867	583				
Atchison			17 964	431				
Barber			7 351	1 136				
Barton	33 523	895						
Bourbon			15 817	638				
Brown			11 663	571				
Butler	47 629	1 443						
Chase	3 324	777						
Chautauqua	4 937	644						
Cherokee			22 307	590				
Cheyenne	3 687	1 021						
Clark					2 726	976		
Clay			9 546	632				
Cloud			12 024	718				
Coffey			10 139	615				
Comanche			2 592	790				
Cowley	37 379	1 128						
Crawford			38 049	595				
Decatur	4 658	894						
Dickinson	19 972	852						
Doniphan			9 005	388				
Douglas			70 265	461				
Edwards			4 107	620				
Elk	3 635	650						

STATE OF KANSAS (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Ellis	29 004	900						
Ellsworth	6 362	717						
Finney			30 041	1 302				
Ford					26 636	1 099		
Franklin			22 337	577				
Geary	29 329	377						
Gove	3 688	1 072						
Graham	4 256	898						
Grant					6 782	575		
Gray					5 373	868		
Greeley					1 917	778		
Greenwood	8 732	1 135						
Hamilton					2 499	998		
Harper	7 767	802						
Harvey	31 144	541						
Haskell					3 876	578		
Hodgeman			2 265	860				
Jackson			11 502	658				
Jefferson			16 072	536				
Jewell			4 396	916				
Johnson			302 948	478				
Kearny					3 901	868		
Kingman	9 141	866						
Kiowa			4 011	723				
Labette	25 690	653						
Lane			2 560	717				
Leavenworth			58 999	463				
Lincoln	3 771	720						
Linn			8 342	601				
Logan			3 458	1 073				

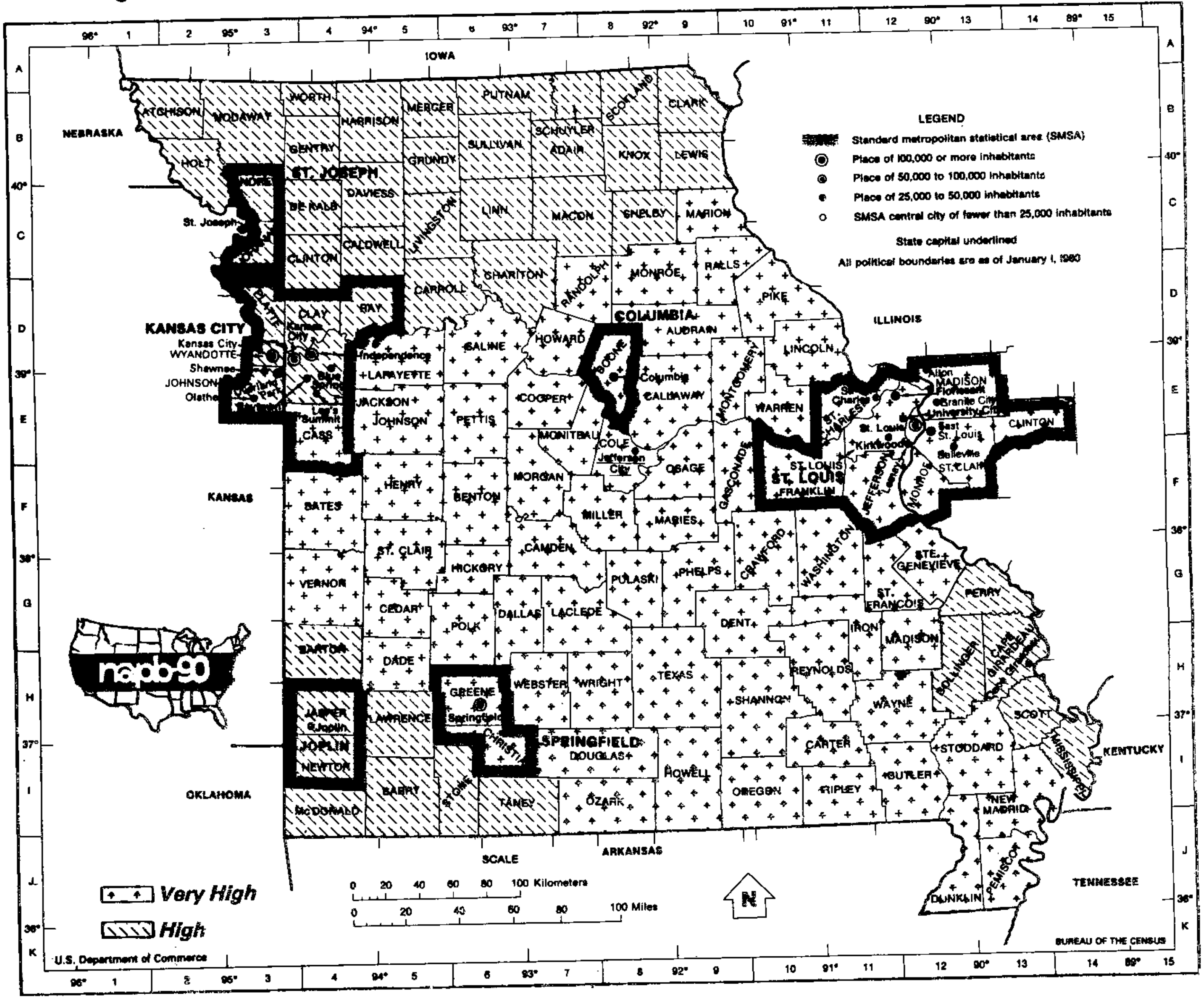
STATE OF KANSAS (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Lyon	38 382	844						
McPherson	27 785	900						
Marion	13 316	944						
Marshall	....	....	13 157	878				
Meade	....	....	....	....	4 652	979		
Miami	....	....	22 370	590				
Mitchell	7 879	717						
Montgomery	42 372	646						
Morris	6 294	693						
Morton	....	....	....	....	3 551	731		
Nemaha	....	....	11 148	719				
Neosho	19 665	576						
Ness	....	....	4 719	1 075				
Norton	6 530	873						
Osage	....	....	16 345	695				
Osborne	5 677	882						
Ottawa	5 823	721						
Pawnee	....	....	8 369	755				
Phillips	7 276	887						
Pottawatomie	....	....	15 954	828				
Pratt	....	....	11 255	735				
Rawlins	3 990	1 069						
Reno	64 889	1 259						
Republic	....	....	7 034	719				
Rice	11 669	728						
Riley	....	....	63 181	593				
Rooks	6 958	888						
Rush	4 427	718						
Russell	9 344	869						
Saline	50 557	721						

STATE OF KANSAS (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Scott			5 905	717				
Sedgwick	385 098	1 007						
Seward					18 408	640		
Shawnee			160 006	549				
Sheridan	3 435	896						
Sherman	7 425	1 057						
Smith	5 576	897						
Stafford			5 886	788				
Stanton					2 451	681		
Stevens					4 863	727		
Sumner	25 457	1 184						
Thomas	9 160	1 075						
Trego	4 428	890						
Wabaunsee			6 775	797				
Wallace			2 075	914				
Washington			7 890	898				
Wichita			2 684	719				
Wilson	11 722	575						
Woodson	4 657	498						
Wyandotte			172 339	149				
TOTAL STATE	1 107 419	39 999	1 259 879	31 295	87 635	10 498	---	---

FEMA Region 7 — MISSOURI — *Potential Fallout*



STATE OF MISSOURI -- FALLOUT RISK

Estimated 1985 Population: 4,968,558
Land Area: 68,576 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Adair	....		25 447	567				
Andrew	....		15 285	436				
Atchison	....		8 640	542				
Audrain	25 774	697						
Barry	....		26 082	773				
Barton	....		11 620	597				
Bates	15 991	849						
Benton	12 507	729						
Bollinger	....		10 414	621				
Boone	107 479	687						
Buchanan	....		86 001	409				
Butler	38 514	698						
Caldwell	....		8 099	431				
Callaway	33 202	542						
Camden	23 226	641						
Cape Girardeau	....		60 804	577				
Carroll	....		11 543	695				
Carter	5 705	509						
Cass	55 154	702						
Cedar	12 412	471						
Chariton	....		10 258	758				
Christian	24 655	564						
Clark	....		8 254	507				
Clay	....		138 910	403				
Clinton	....		16 139	423				

STATE OF MISSOURI (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Cole	61 687	392						
Cooper	14 592	566						
Crawford	19 043	744						
Dade	7 533	491						
Dallas	12 760	543						
Daviess	....		8 648	568				
DeKalb	....		8 127	425				
Dent	14 934	755						
Douglas	12 608	814						
Dunklin	35 924	547						
Franklin	74 755	922						
Gasconade	13 677	521						
Gentry	....		7 919	493				
Greene	194 885	678						
Grundy	....		11 542	437				
Harrison	....		9 919	725				
Henry	19 582	729						
Hickory	7 044	379						
Holt	....		6 649	456				
Howard	9 972	464						
Howell	30 461	927						
Iron	11 542	552						
Jackson	....		634 530	611				
Jasper	....		89 889	641				
Jefferson	158 515	661						
Johnson	38 244	834						
Knox	....		5 277	507				
LaClede	26 106	768						
LaFayette	30 315	632						
Lawrence	....		30 322	614				

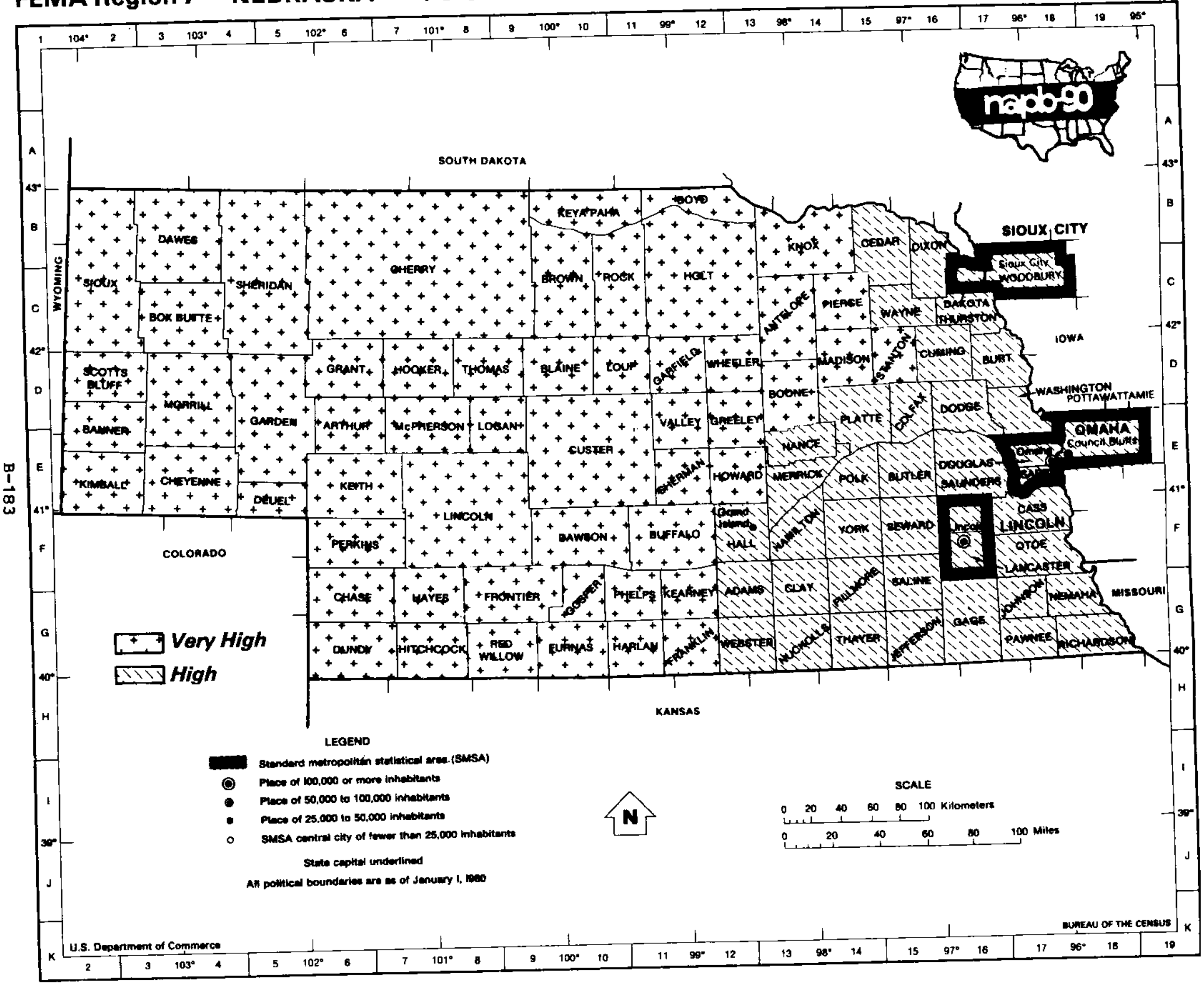
STATE OF MISSOURI (Continued)

COUNTY	VERY HIGH RISK POPULATION	 AREA	HIGH RISK POPULATION	 AREA	MEDIUM RISK POPULATION	 AREA	LOW RISK POPULATION	 AREA
Lewis	....	....	11 165	508				
Lincoln	24 138	627						
Linn	....	....	15 542	620				
Livingston	....	....	15 532	537				
McDonald	....	....	15 830	541				
Macon	....	....	17 010	797				
Madison	11 008	497						
Maries	7 896	528						
Marion	29 304	438						
Mercer	....	....	4 597	454				
Miller	20 308	593						
Mississippi	....	....	15 770	410				
Moniteau	....	....	12 906	417				
Monroe	9 699	670						
Montgomery	11 566	540						
Morgan	15 540	594						
New Madrid	22 345	658						
Newton	....	....	43 026	627				
Nodaway	....	....	22 573	875				
Oregon	10 036	792						
Osage	12 200	606						
Ozark	8 858	731						
Pemiscot	24 155	517						
Perry	....	....	17 125	473				
Pettis	35 726	686						
Phelps	35 514	674						
Pike	16 953	673						
Platte	....	....	49 863	421				
Polk	20 220	636						
Pulaski	44 051	550						

STATE OF MISSOURI (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Putnam	....		5 858	520				
Ralls	9 076	481						
Randolph	26 165	477						
Ray	....		21 878	568				
Reynolds	7 162	808						
Ripley	12 767	632						
St Charles	166 248	558						
St Clair	8 667	698						
Ste Genevieve	15 238	504						
St Francois	43 670	451						
St Louis	990 381	505						
Saline	25 067	755						
Schuyler	....		4 721	308				
Scotland	....		5 278	439				
Scott	....		40 428	423				
Shannon	8 095	1 004						
Shelby	....		7 652	501				
Stoddard	28 536	818						
Stone	....		17 337	451				
Sullivan	....		7 134	651				
Taney	....		24 151	608				
Texas	21 640	1 108						
Vernon	19 850	837						
Warren	16 799	429						
Washington	18 661	762						
Wayne	11 804	763						
Webster	21 915	594						
Worth	....		2 968	266				
Wright	16 431	682						
St Louis (City)	423 409	61						
TOTAL STATE	3 339 896	43 945	1 628 662	24 631	---	---	---	---

FEMA Region 7 — NEBRASKA — *Potential Fallout*



STATE OF NEBRASKA -- FALLOUT RISK

Estimated 1985 Population: 1,614,811
Land Area: 76,639 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	VERY HIGH RISK [GT 15000R] AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	HIGH RISK [EQ/GT 6000R LT 15000R] AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	MEDIUM RISK [EQ/GT 3000R LT 6000R] AREA	LOW RISK [LT 3000R] POPULATION	LOW RISK [LT 3000R] AREA
Adams	....		31 141	564				
Antelope	8 726	859						
Arthur	475	710						
Banner	1 084	747						
Blaine	775	714						
Boone	7 343	687						
Box Butte	14 324	1 077						
Boyd	3 325	532						
Brown	4 287	1 214						
Buffalo	38 764	946						
Burt	....		8 741	486				
Butler	....		9 138	584				
Cass	....		21 808	557				
Cedar	....		11 255	740				
Chase	4 924	893						
Cherry	6 867	5 961						
Cheyenne	10 046	1 196						
Clay	....		7 815	574				
Colfax	....		9 545	410				
Cuming	....		11 447	575				
Custer	13 677	2 571						
Dakota	....		17 369	258				
Dawes	9 362	1 397						
Dawson	22 298	982						
Deuel	2 358	437						

STATE OF NEBRASKA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Dixon	....		6 864	474				
Dodge	....		35 764	534				
Douglas	....		413 626	333				
Dundy	2 894	920						
Fillmore	....		7 732	576				
Franklin	4 293	576						
Frontier	3 632	976						
Furnas	6 536	721						
Gage	....		23 940	858				
Garden	2 725	1 680						
Garfield	2 422	570						
Gosper	2 160	461						
Grant	878	775						
Greeley	3 320	570						
Hall	....		50 376	537				
Hamilton	....		9 232	542				
Harlan	4 288	555						
Hayes	1 316	714						
Hitchcock	3 965	709						
Holt	14 004	2 406						
Hooker	1 024	720						
Howard	6 707	564						
Jefferson	....		9 535	575				
Johnson	....		5 057	376				
Kearney	6 690	519						
Keith	9 138	1 039						
Keya Paha	1 237	769						
Kimball	4 967	952						
Knox	11 198	1 105						
Lancaster	....		205 512	839				

STATE OF NEBRASKA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Lincoln	34 217	2 525						
Logan	969	571						
Loup	897	574						
McPherson	561	859						
Madison	32 468	575						
Merrick	....		8 628	478				
Morril	6 029	1 405						
Nance	....		4 594	439				
Nemaha	....		8 330	408				
Nuckolls	....		6 792	576				
Otoe	....		15 120	615				
Pawnee	....		3 695	432				
Perkins	3 813	885						
Phelps	10 198	540						
Pierce	8 514	575						
Platte	....		29 752	669				
Polk	....		5 973	437				
Red Willow	12 999	718						
Richardson	....		10 905	553				
Rock	2 456	1 003						
Saline	....		13 066	576				
Sarpy	....		95 470	238				
Saunders	....		18 574	753				
Scotts Bluff	38 419	725						
Seward	....		15 820	575				
Sheridan	7 807	2 453						
Sherman	3 972	564						
Sioux	1 738	2 069						
Stanton	6 437	431						
Thayer	....		7 463	575				

STATE OF NEBRASKA (Continued)

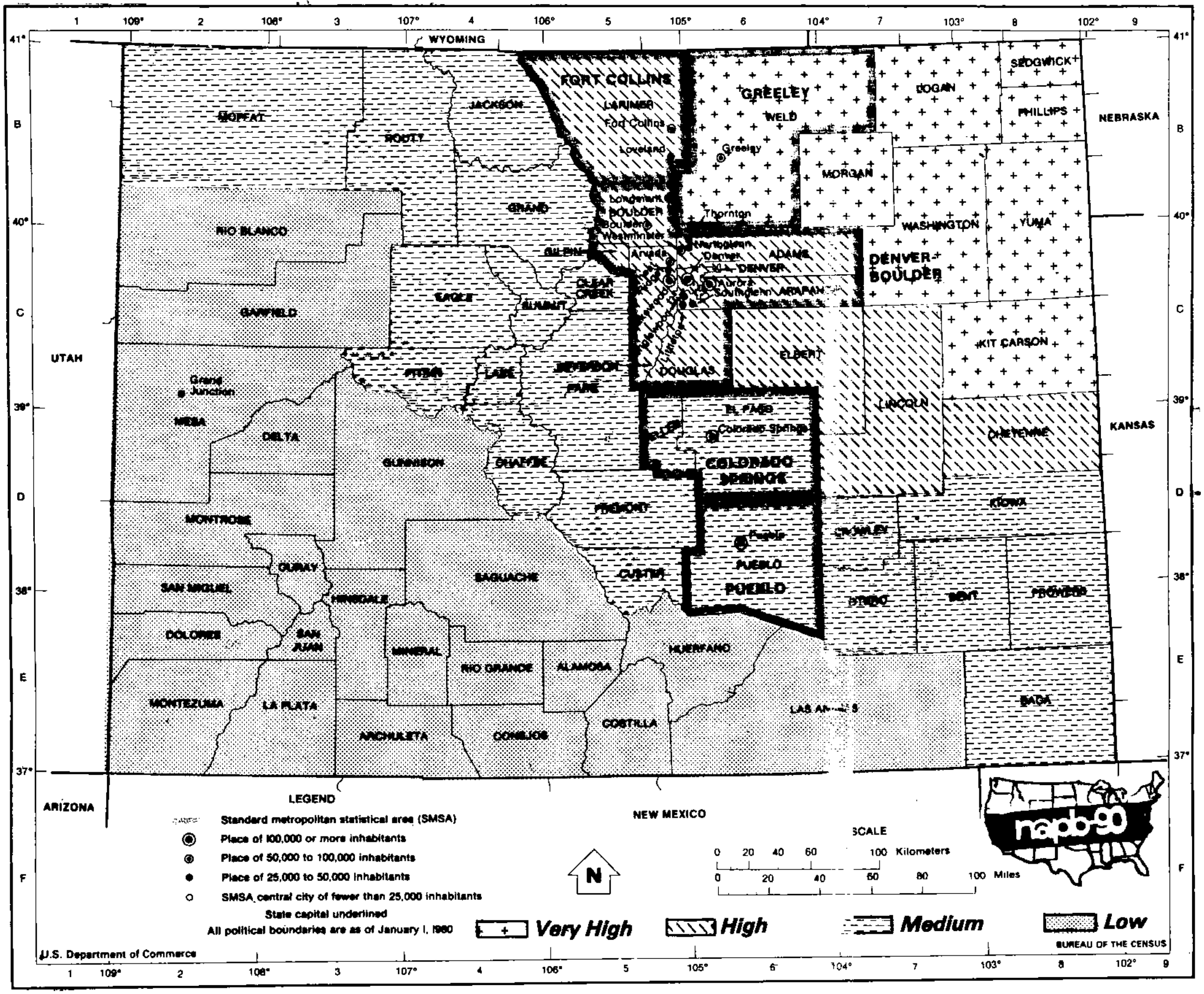
COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Thomas	965	714						
Thurston	7 194	391						
Valley	5 871	567						
Washington	....		15 464	386				
Wayne	....		9 801	443				
Webster	....		4 787	575				
Wheeler	1 101	575						
York	....		15 046	576				
TOTAL STATE	429 634	56 943	1 185 177	19 696	---	---	---	---

FEMA REGION VIII -- FALLOUT RISK SUMMARY

Estimated 1985 Population: 7,709,731
Land Area: 573,497 square miles

STATE	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Colorado	208 479	15 358	2 022 824	13 470	679 583	32 058	339 232	42 766
Montana	521 557	97 043	99 708	25 565	211 607	22 757	---	---
North Dakota	563 779	50 678	133 797	18 666	---	---	---	---
South Dakota	232 028	39 459	476 700	36 497	---	---	---	---
Utah	---	---	167 391	1 169	1 021 379	13 537	510 097	67 388
Wyoming	95 053	7 073	258 778	45 559	167 739	44 454	---	---
TOTAL REGION VIII	1 620 896	209 611	3 159 198	140 926	2 080 308	112 806	849 329	111 154

FEMA Region 8 — COLORADO — *Potential Fallout*



S T A T E   O F   C O L O R A D O - - F A L L O U T   R I S K

Estimated 1985 Population: 3,250,118
Land Area: 103,652 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Adams			277 973	1 235				
Alamosa							12 588	719
Arapahoe			378 836	800				
Archuleta							5 798	1 353
Baca					5 133	2 554		
Bent					5 913	1 008		
Boulder			213 665	742				
Chaffee					12 793	1 008		
Chjeyenne			2 475	1 783				
Clear Creek							7 283	397
Conejos							8 148	1 285
Costilla							3 564	1 227
Crowley					3 282	790		
Custer					1 952	740		
Delta							24 615	1 141
Denver			507 548	111				
Dolores							1 792	1 064
Douglas			35 853	841				
Eagle					17 085	1 690		
Elbert			8 500	1 851				
El Paso					358 941	2 129		
Fremont					31 488	1 538		
Garfield							28 651	2 952
Gilpin			2 822	149				
Grand					9 077	1 854		

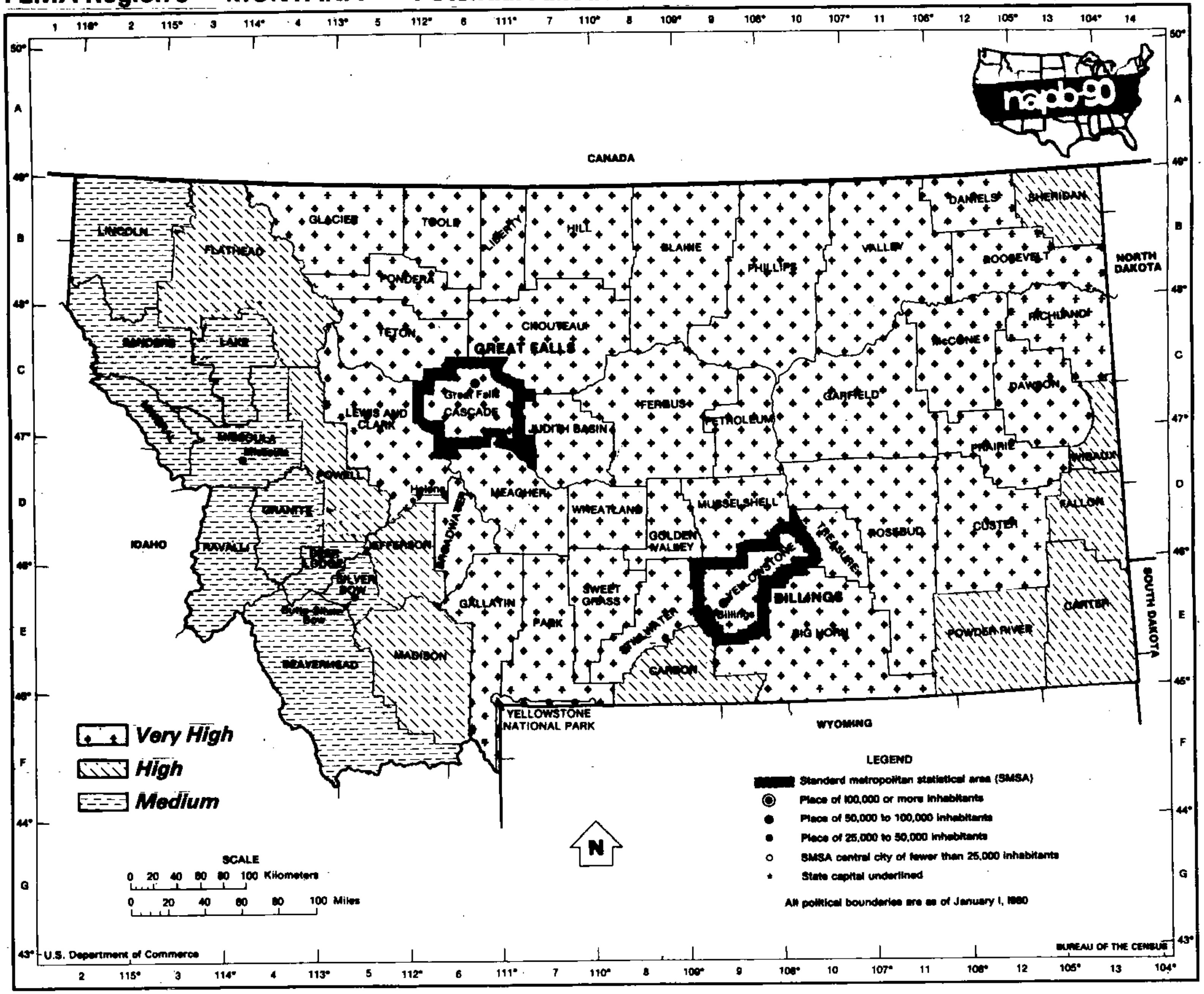
STATE OF COLORADO (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Gunnison							10 471	3 238
Hinsdale							531	1 115
Huerfano							7 187	1 583
Jackson					1 732	1 615		
Jefferson			420 750	1 615				
Kiowa					1 947	1 758		
Kit Carson	7 960	2 160						
Lake					6 762	379		
La Plata							31 744	1 692
Larimer			169 855	2 604				
Las Animas							14 778	4 771
Lincoln			4 547	2 586				
Logan	19 921	1 819						
Mesa							98 752	3 309
Mineral							808	877
Moffat					15 593	4 732		
Montezuma							20 001	2 083
Montrose							26 409	2 240
Morgan	23 440	1 276						
Otero					22 191	1 247		
Ouray							2 241	542
Park							7 201	2 192
Phillips	4 653	688						
Pitkin					10 356	968		
Prowers					14 492	1 629		
Pueblo					124 546	2 377		
Rio Blanco							6 960	3 222
Rio Grande							11 468	913
Routt					13 951	2 267		
Saguache							4 141	3 176

STATE OF COLORADO (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
San Juan							1 085	388
San Miguel							3 006	1 287
Sedgwick	3 187	540						
Summit					11 192	607		
Teller					11 157	559		
Washington	5 548	2 520						
Weld	133 779	3 990						
Yuma	9 991	2 365						
TOTAL STATE	208 479	15 358	2 022 824	13 470	679 583	32 058	339 232	42 766

FEMA Region 8 — MONTANA — *Potential Fallout*



STATE OF MONTANA -- FALLOUT RISK

Estimated 1985 Population: 832,872
Land Area: 145,365 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	VERY HIGH RISK [GT 15000R] AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	HIGH RISK [EQ/GT 6000R LT 15000R] AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	MEDIUM RISK [EQ/GT 3000R LT 6000R] AREA	LOW RISK [LT 3000R] POPULATION	LOW RISK [LT 3000R] AREA
Beaverhead					8 849	5 529		
Big Horn	11 639	4 983						
Blaine	7 056	4 259						
Broadwater	3 459	1 188						
Carbon			8 734	2 056				
Carter			1 751	3 342				
Cascade	82 077	2 699						
Chouteau	6 186	3 988						
Custer	13 535	3 776						
Daniels	2 758	1 427						
Dawson	12 939	2 347						
Deer Lodge					10 873	740		
Fallon			3 767	1 623				
Fergus	12 880	4 340						
Flathead			54 349	5 112				
Gallatin	48 749	2 510						
Garfield	1 704	4 491						
Glacier	11 450	2 995						
Golden Valley	1 114	1 172						
Granite					2 841	1 729		
Hill	18 678	2 897						
Jefferson			8 286	1 656				
Judith Basin	2 716	1 871						
Lake					20 728	1 493		
Lewis and Clark	46 434	3 461						

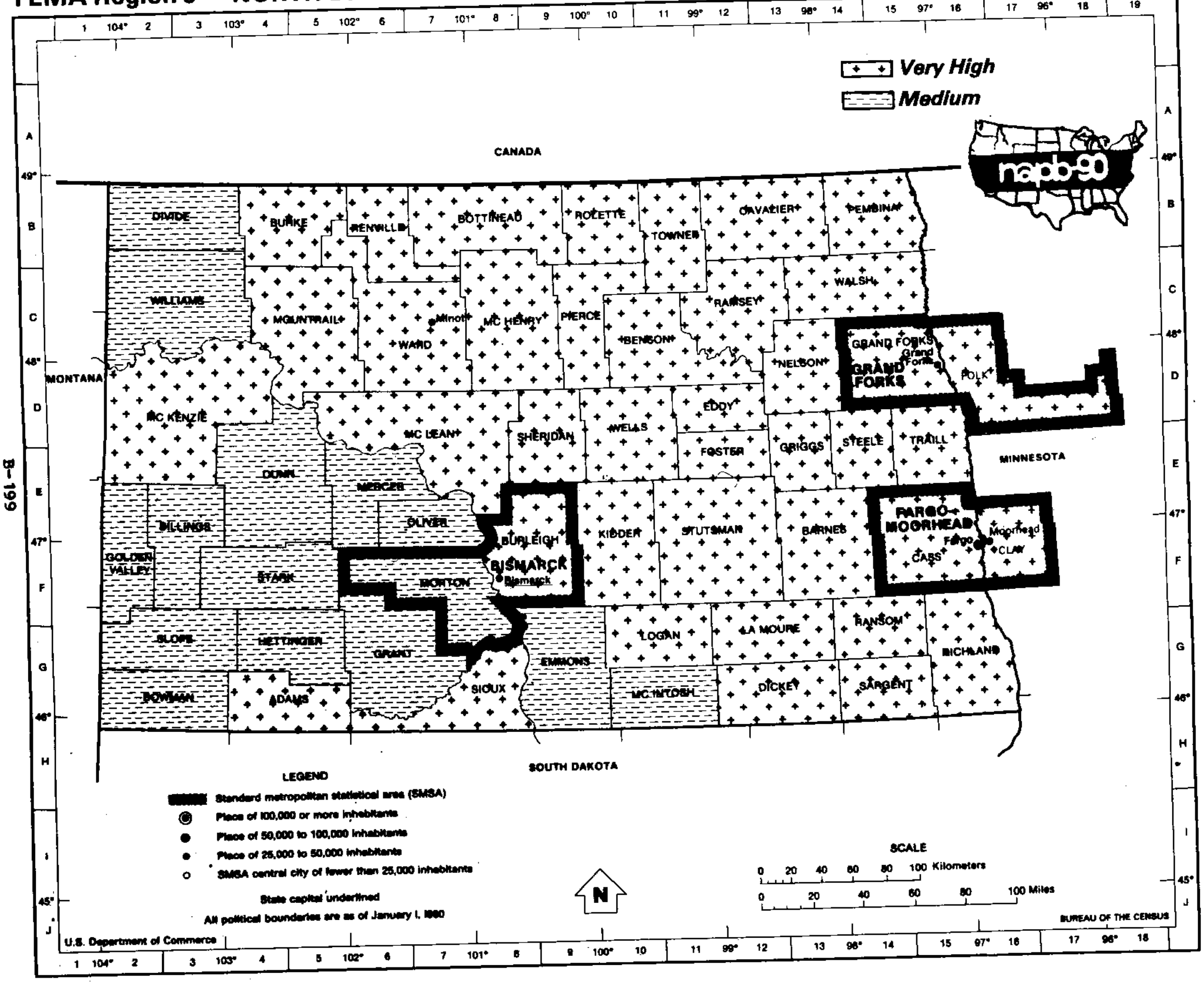
STATE OF MONTANA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Liberty	2 597	1 427						
Lincoln	....	....	....	....	18 885	3 616		
McCone	2 703	2 626						
Madison	....	....	5 933	3 590				
Meagher	2 247	2 392						
Mineral	....	....	....	....	3 694	1 216		
Missoula	....	....	....	....	76 535	2 582		
Musselshell	4 373	2 665						
Park	13 373	2 665						
Petroleum	676	1 652						
Phillips	5 756	5 131						
Pondera	7 155	1 632						
Powder River	....	....	2 471	3 288				
Powell	....	....	6 849	2 329				
Prairie	1 873	1 732						
Ravalli	....	....	....	....	25 404	2 384		
Richland	14 890	2 081						
Roosevelt	11 848	2 357						
Rosebud	13 959	5 019						
Sanders	....	....	....	....	9 326	2 749		
Sheridan	....	....	6 072	1 681				
Silver Bow	....	....	....	....	34 471	719		
Stillwater	6 114	1 793						
Sweetgrass	3 321	1 856						
Teton	6 424	2 275						
Toole	5 784	1 931						
Treasure	1 019	975						
Valley	9 916	4 936						
Wheatland	2 291	1 419						
Wibaux	....	....	1 496	888				

STATE OF MONTANA (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Yellowstone	121 398	2 624						
Yellowstone National	66	245						
TOTAL STATE	521 557	97 043	99 708	25 565	211 607	22 757	---	---

FEMA Region 8 — NORTH DAKOTA — *Potential Fallout*



STATE OF NORTH DAKOTA -- FALLOUT RISK

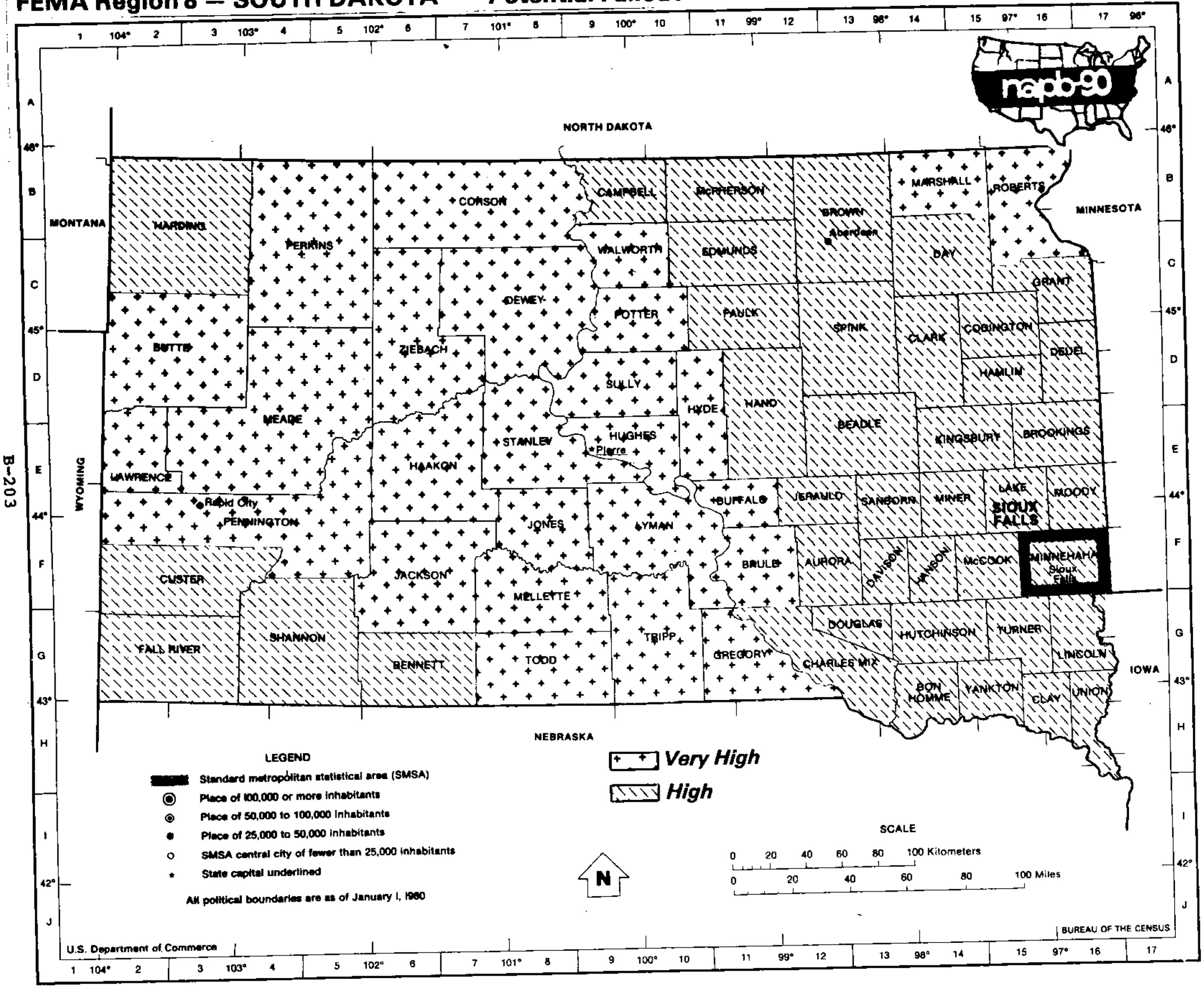
Estimated 1985 Population: 697,576
Land Area: 69,344 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	VERY HIGH RISK [GT 15000R] AREA	HIGH RISK [EQ/GT 600R LT 15000R] POPULATION	HIGH RISK [EQ/GT 600R LT 15000R] AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	MEDIUM RISK [EQ/GT 3000R LT 6000R] AREA	LOW RISK [LT 3000R] POPULATION	LOW RISK [LT 3000R] AREA
Adams	3 494	988						
Barnes	13 666	1 498						
Benson	8 099	1 412						
Billings	....		1 332	1 152				
Bottineau	9 120	1 668						
Bowman	....		4 334	1 162				
Burke	3 655	1 118						
Burleigh	60 173	1 618						
Cass	97 117	1 767						
Cavalier	7 029	1 507						
Dickey	6 876	1 139						
Divide	....		3 200	1 288				
Dunn	....		5 380	1 993				
Eddy	3 230	634						
Emmons	5 692	1 499						
Foster	4 564	640						
Golden Valley	....		2 688	1 003				
Grand Forks	69 331	1 440						
Grant	....		4 147	1 660				
Griggs	3 631	780						
Hettinger	....		3 954	1 133				
Kidder	3 777	1 362						
La Moure	6 037	1 150						
Logan	3 203	1 000						
McHenry	7 432	1 887						

STATE OF NORTH DAKOTA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
McIntosh	……………………		4 406	984				
McKenzie	8 890	2 754						
McLean	13 042	2 065						
Mercer	……………………		16 279	1 044				
Morton	……………………		27 044	1 920				
Mountrail	8 188	1 837						
Nelson	4 946	991						
Oliver	……………………		2 724	723				
Pembina	10 129	1 120						
Pierce	5 998	1 037						
Ramsey	13 031	1 241						
Ransom	6 452	862						
Renville	3 555	874						
Richland	20 230	1 436						
Rolette	13 300	914						
Sargent	5 186	858						
Sheridan	2 606	990						
Sioux	3 753	1 099						
Slope	……………………		1 148	1 219				
Stark	……………………		28 911	1 338				
Steele	2 896	714						
Stutsman	23 547	2 263						
Towner	4 752	1 036						
Traill	9 285	861						
Walsh	15 579	1 290						
Ward	65 495	2 041						
Wells	6 793	1 288						
Williams	……………………		28 270	2 047				
TOTAL STATE	563 779	50 678	133 797	18 666	---	---	---	---

FEMA Region 8 — SOUTH DAKOTA — *Potential Fallout*



STATE OF SOUTH DAKOTA -- FALLOUT RISK

Estimated 1985 Population: 708,728
Land Area: 75,956 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Aurora	....		3 435	707				
Beadle	....		18 136	1 259				
Bennett	....		3 313	1 181				
Bon Homme	....		7 814	552				
Brookings	....		25 165	795				
Brown	....		36 712	1 722				
Brule	5 408	815						
Buffalo	1 685	476						
Butte	8 125	2 251						
Campbell	....		2 274	732				
Charles Mix	....		9 719	1 090				
Clark	....		4 950	953				
Clay	....		13 647	408				
Codington	....		22 368	695				
Corson	5 243	2 467						
Custer	....		6 795	1 559				
Davison	....		17 806	436				
Day	....		7 893	1 022				
Deuel	....		5 203	631				
Dewey	5 487	2 310						
Douglas	....		3 894	434				
Edmunds	....		4 933	1 149				
Fall River	....		7 820	1 740				
Faulk	....		3 312	1 003				
Grant	....		9 582	681				

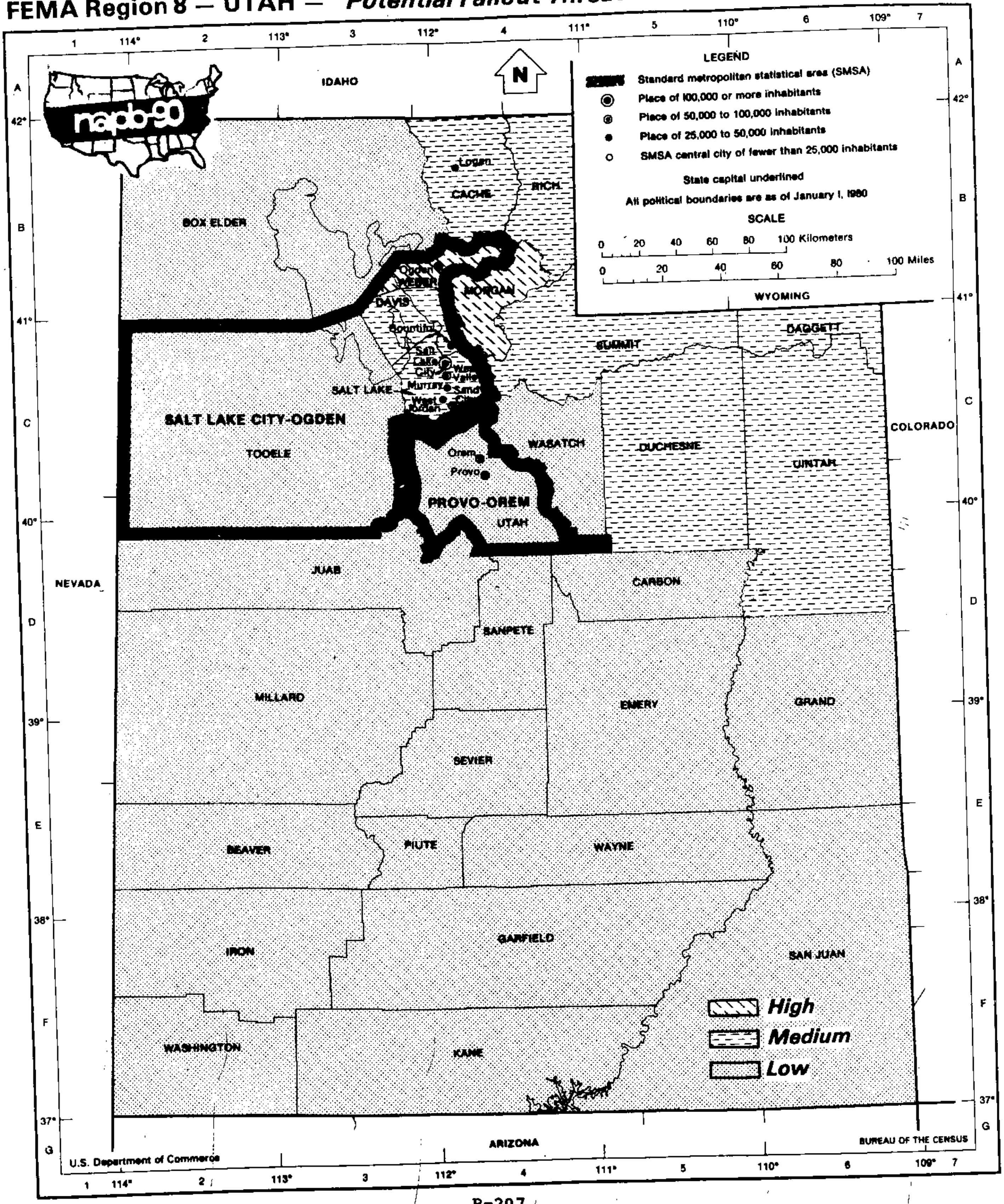
STATE OF SOUTH DAKOTA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Gregory	5 871	1 041						
Haakon	2 965	1 822						
Hamlin	....		5 251	512				
Hand	....		4 701	1 437				
Hanson	....		3 290	433				
Harding	....		1 889	2 678				
Hughes	14 830	757						
Hutchinson	....		9 045	816				
Hyde	1 909	860						
Jackson	3 266	1 872						
Jerauld	....		2 728	530				
Jones	1 500	971						
Kingsbury	....		6 493	824				
Lake	....		11 002	560				
Lawrence	19 380	800						
Lincoln	....		14 384	578				
Lyman	3 892	1 679						
McCook	....		6 234	576				
McPherson	....		3 766	1 148				
Marshall	5 209	848						
Meade	21 716	3 481						
Mellette	2 365	1 311						
Miner	....		3 482	570				
Minnehaha	....		120 296	810				
Moody	....		6 964	520				
Pennington	75 780	2 783						
Perkins	4 649	2 885						
Potter	3 715	869						
Roberts	11 063	1 102						
Sanborn	....		3 093	569				

STATE OF SOUTH DAKOTA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Shannon	....		11 207	2 094				
Spink	....		9 081	1 505				
Stanley	2 451	1 432						
Sully	1 868	972						
Todd	7 256	1 388						
Tripp	7 188	1 618						
Turner	....		9 126	617				
Union	....		10 774	453				
Walworth	6 624	707						
Yankton	....		19 123	518				
Ziebach	2 493	1 969						
TOTAL STATE	232 028	39 459	476 700	36 497	---	---	---	---

FEMA Region 8 — UTAH — *"Potential Fallout Threat"*



STATE OF UTAH -- FALLOUT RISK

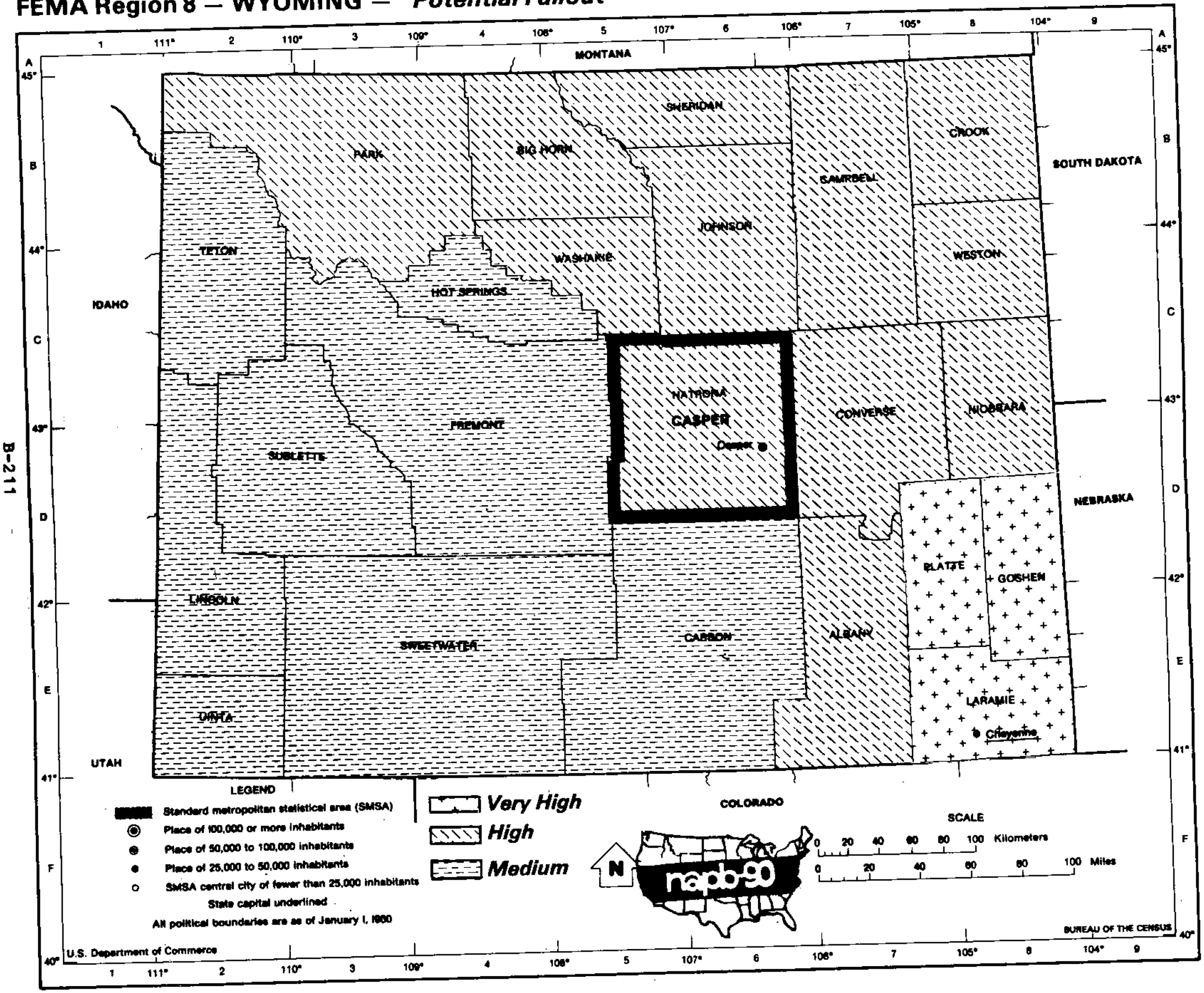
Estimated 1985 Population: 1,698,867
Land Area: 82,094 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Beaver							5 280	2 586
Box Elder							37 769	5 614
Cache					66 658	1 171		
Carbon							26 132	1 479
Daggett					856	699		
Davis					174 969	299		
Duchesne					16 271	3 234		
Emery							13 911	4 449
Garfield							4 319	4 449
Grand							7 957	3 689
Iron							20 357	3 302
Juab							6 274	3 396
Kane							4 509	3 898
Millard							13 762	6 818
Morgan			5 285	603				
Piute							1 476	759
Rich					2 638	1 034		
Salt Lake					716 909	756		
San Juan							12 096	7 725
Sanpete							17 343	1 586
Sevier							16 360	1 910
Summit					13 230	1 865		
Tooele							29 408	6 919
Unintah					29 848	4 479		
Utah							246 181	2 018

STATE OF UTAH (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Wasatch							10 044	1 191
Washington							34 783	2 422
Wayne							2 136	2 461
Weber			162 106	566				
TOTAL STATE	---	---	167 391	1 169	1 021 379	13 537	510 097	67 388

FEMA Region 8 — WYOMING — *Potential Fallout*



STATE OF WYOMING -- FALLOUT RISK

Estimated 1985 Population: 521,570
Land Area: 97,086 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	VERY HIGH RISK [GT 15000R] AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	HIGH RISK [EQ/GT 6000R LT 15000R] AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	MEDIUM RISK [EQ/GT 3000R LT 6000R] AREA	LOW RISK [LT 3000R] POPULATION	LOW RISK [LT 3000R] AREA
Albany			30 328	4 286				
Big Horn			12 559	3 139				
Campbell			37 605	4 796				
Carbon					20 407	7 878		
Converse			15 207	4 271				
Crook			6 058	2 856				
Fremont					36 886	9 181		
Goshen	12 430	2 186						
Hot Springs					6 119	2 005		
Johnson			7 107	4 166				
Laramie	73 254	2 864						
Lincoln					15 176	4 070		
Natrona			75 746	5 247				
Niobara			3 358	2 685				
Park			25 213	6 936				
Platte	9 369	2 023						
Sheridan			27 466	2 532				
Sublette					5 572	4 871		
Sweetwater					45 791	10 352		
Teton					11 553	4 012		
Uinta					26 235	2 085		
Washakie			10 106	2 243				
Weston			8 025	2 402				
TOTAL STATE	95 053	7 073	258 778	45 559	167 739	44 454	---	---

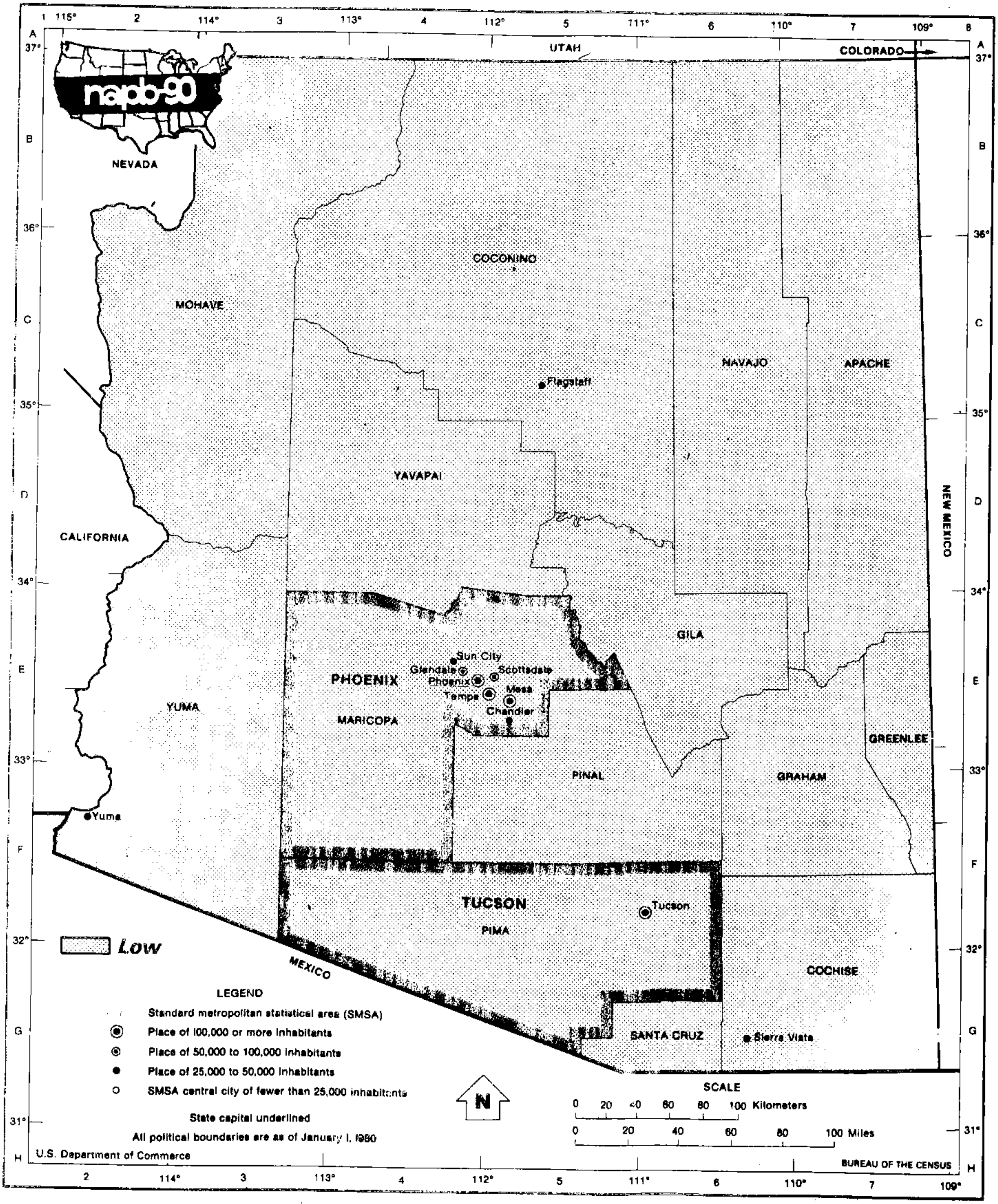
FEMA REGION IX -- FALLOUT RISK SUMMARY

Estimated 1985 Population: 31,504,342
Land Area: 386,970 square miles

STATE	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 300R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Arizona	---	---	---	---	---	---	3 138 988	113 550
California	1 351 111	20 941	14 558 057	52 204	8 881 071	39 675	1 315 605	43 459
Hawaii	---	---	---	---	---	---	1 057 270	6 427
Nevada	---	---	---	---	611 497	32 602	326 694	77 293
American Samoa	---	---	---	---	---	---	35 000*	77
Guam	---	---	---	---	---	---	112 900	209
Trust Territory	---	---	---	---	---	---	116 149*	533
TOTAL REGION IX	1 351 111	20 941	14 558 057	52 204	9 492 568	72 277	6 102 606	241 548

* 1980 Census

FEMA Region 9 – ARIZONA – *Potential Fallout*

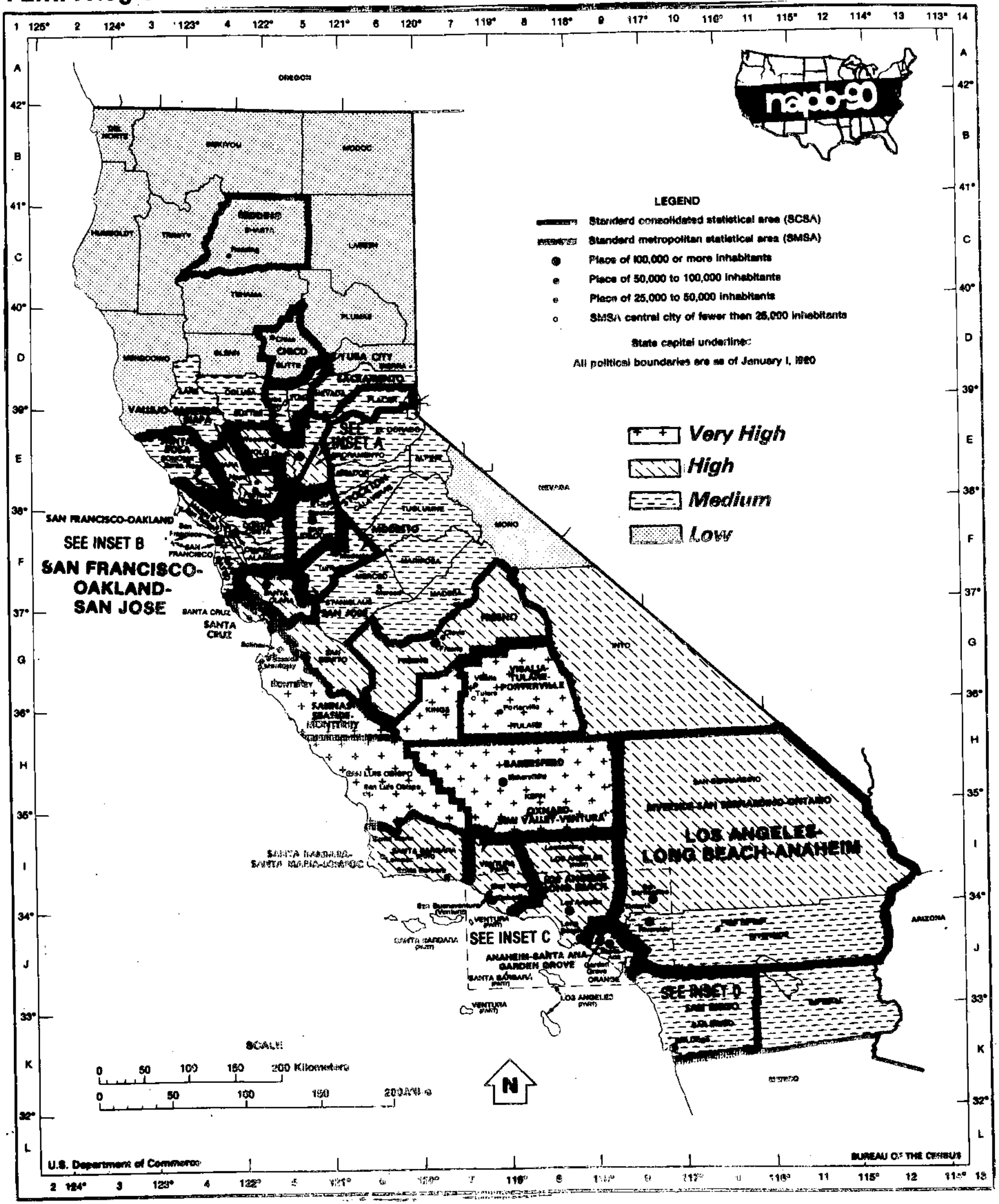


STATE OF ARIZONA -- FALLOUT RISK

Estimated 1985 Population: 3,138 988
Land Area: 113,550 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Apache							53 418	11 211
Cochise							95 247	6 219
Coconino							85 381	18 608
Gila							38 830	4 753
Graham							23 316	4 631
Greenlee							9 640	1 837
Maricopa							1 766 060	9 127
Mohave							71 818	13 285
Navajo							72 022	9 995
Pima							610 597	9 187
Pinal							102 303	5 343
Santa Cruz							21 417	1 238
Yavapai							81 196	8 122
Yuma							107 743	9 994
TOTAL STATE	---	---	---	---	---	---	3 138 988	113 550

FEMA Region 9 — CALIFORNIA — *Potential Fallout*



napb-90
LEGEND
Standard consolidated statistical area (SCSA)
Standard metropolitan statistical area (SMSA)
Place of 100,000 or more inhabitants
Place of 50,000 to 100,000 inhabitants
Place of 25,000 to 50,000 inhabitants
SMSA central city of fewer than 25,000 inhabitants
State capital underlined
All political boundaries are as of January 1, 1980
Very High
High
Medium
Low
OREGON
NEVADA
ARIZONA
MEXICO
SEE INSET A
SAN FRANCISCO-OAKLAND
SEE INSET B
SAN FRANCISCO-OAKLAND-SAN JOSE
SANTA CRUZ
SAN JOSE
FRESNO
VISALIA-TULARE-PORTERVILLE
SALINAS-SEASIDE-MONTEREY
BAKERSFIELD
OXNARD-SIMI VALLEY-VENTURA
SANTA BARBARA-SANTA MARIA-LOMPOC
LOS ANGELES-LONG BEACH-ANAHEIM
RIVERSIDE-SAN BERNARDINO-ONTARIO
SEE INSET C
ANAHEIM-SANTA ANA-GARDEN GROVE
SEE INSET D
SAN DIEGO
CHICO
YUBA CITY
SACRAMENTO
VALLEJO-NAPA
STOCKTON
MODESTO
MERCED
SCALE
0 50 100 150 200 Kilometers
0 50 100 150 200 Miles
N
U.S. Department of Commerce
BUREAU OF THE CENSUS

STATE OF CALIFORNIA -- FALLOUT RISK

Estimated 1985 Population: 26,105,844
Land Area: 156,279 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Alameda					1 190 343	736		
Alpine					1 141	739		
Amador							22 813	589
Butte							162 165	1 646
Calaveras					26 876	1 021		
Colusa					14 543	1 153		
Contra Costa					708 382	730		
Del Norte							18 370	1 007
El Dorado					102 112	1 715		
Fresno			574 401	5 978				
Glenn							22 999	1 319
Humboldt							112 294	3 579
Imperial					104 881	4 173		
Inyo			18 372	10 223				
Kern	477 128	8 130						
Kings	83 706	1 392						
Lake					47 940	1 262		
Lassen							24 433	4 553
Los Angeles			8 006 962	4 070				
Madera					76 585	2 145		
Marin			224 538	523				
Mariposa					13 230	1 456		
Mendocino							72 881	3 512
Merced					159 970	1 944		
Modoc							9 810	4 046

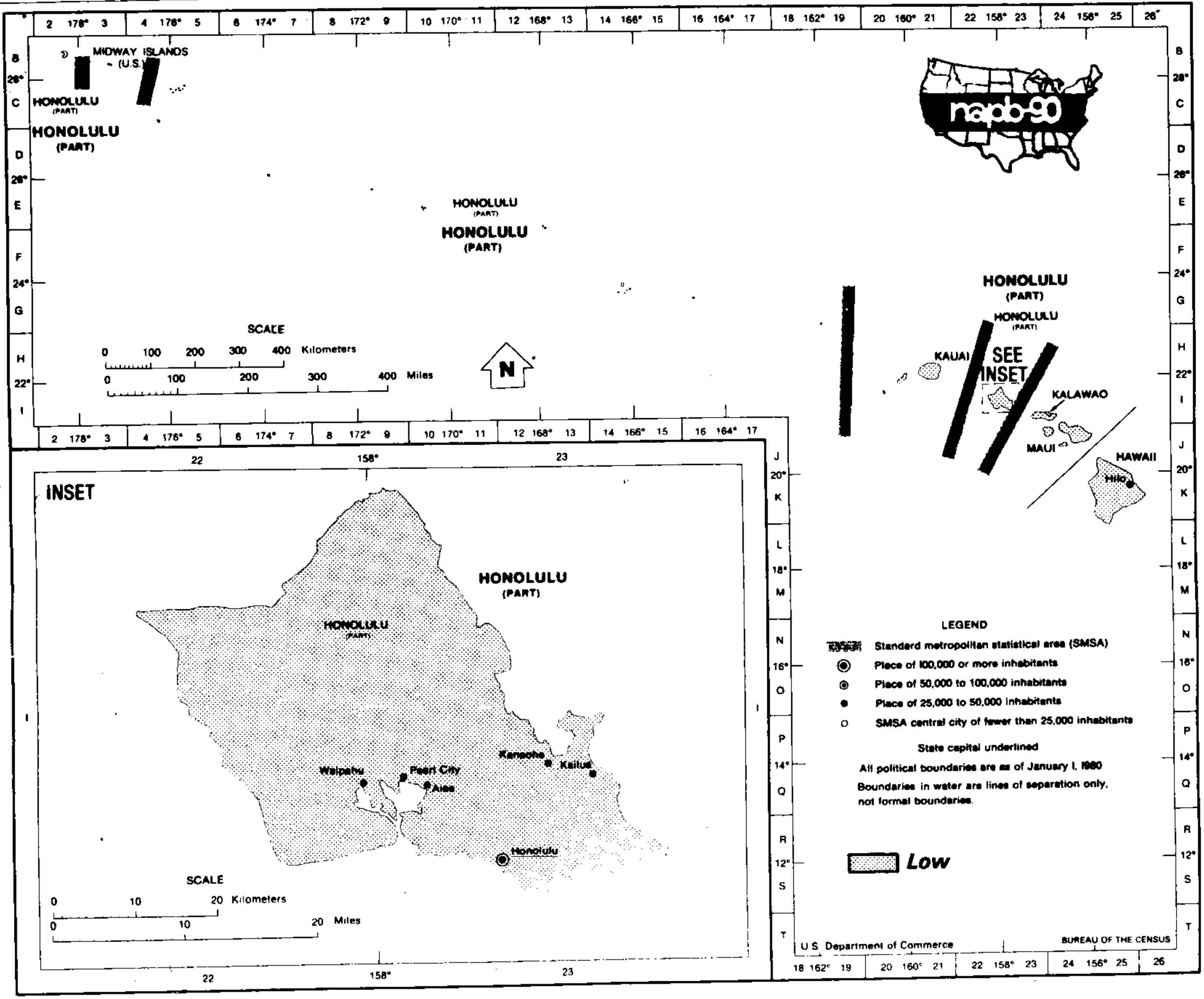
STATE OF CALIFORNIA (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Mono							9 243	3 019
Monterey	326 370	3 303						
Napa			102 667	744				
Nevada					68 276	960		
Orange					2 111 396	798		
Placer					137 111	1 416		
Plumas							18 745	2 573
Riverside					805 521	7 214		
Sacremento			887 649	971				
San Benito			30 158	1 388				
San Bernadino			1 068 239	20 064				
San Diego					2 114 283	4 212		
San Francisco			721 187	46				
San Joaquin					411 407	1 415		
San Luis Obispo	184 867	3 308						
San Mateo							609 317	447
Santa Barbara			328 764	2 748				
Santa Clara			1 390 579	1 293				
Santa Cruz			210 206	446				
Shasta							129 180	3 786
Sierra							3 403	959
Siskiyou							42 324	6 281
Soland			273 235	834				
Sonoma					332 912	1 604		
Stanislaus					303 105	1 506		
Sutter					58 181	602		
Tehama							44 142	2 953
Trinity							13 486	3 190
Tulare	279 040	4 808						
Tuolumne					39 613	2 234		

STATE OF CALIFORNIA (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
Ventura	....	....	598 564	1 862				
Yolo	....	....	122 536	1 014				
Yuba	....	....	....	....	53 263	640		
TOTAL STATE	1 351 111	20 941	14 558 057	52 204	8 881 071	39 675	1 315 605	43 459

FEMA Region 9— HAWAII — *Potential Fallout*

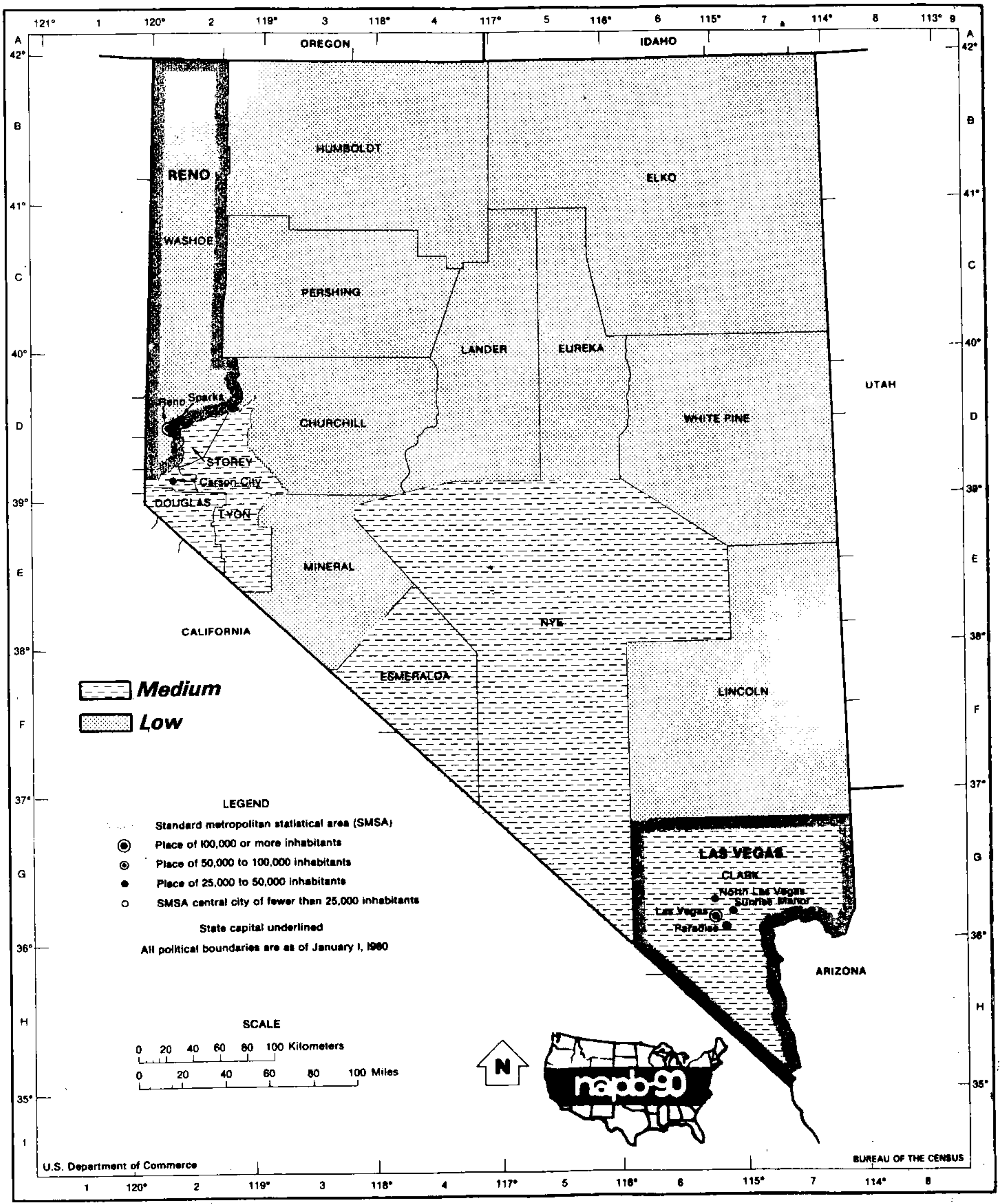

MIDWAY ISLANDS (U.S.)
HONOLULU (PART)
HONOLULU (PART)
HONOLULU (PART)
HONOLULU (PART)
HONOLULU (PART)
HONOLULU (PART)
KAUAI
SEE INSET
KALAWAO
MAUI
HAWAII
Hilo
SCALE
0 100 200 300 400 Kilometers
0 100 200 300 400 Miles
N
napb-90
INSET
HONOLULU (PART)
HONOLULU (PART)
Waipahu
Pearl City
Aiea
Kaneohe
Kailua
Honolulu
SCALE
0 10 20 Kilometers
0 10 20 Miles
LEGEND
Standard metropolitan statistical area (SMSA)
Place of 100,000 or more inhabitants
Place of 50,000 to 100,000 inhabitants
Place of 25,000 to 50,000 inhabitants
SMSA central city of fewer than 25,000 inhabitants
State capital underlined
All political boundaries are as of January 1, 1980
Boundaries in water are lines of separation only, not formal boundaries.
Low
U.S. Department of Commerce
BUREAU OF THE CENSUS

STATE OF HAWAII -- FALLOUT RISK

Estimated 1985 Population: 1,057,270
Land Area: 6,427 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Hawaii	....	....	....	....	....	....	109 953	4 034
Honolulu	....	....	....	....	....	....	815 900	597
Kalawaa	....	....	....	....	....	....	144	14
Kauai	....	....	....	....	....	....	45 191	620
Maui	....	....	....	....	....	....	86 082	1 162
TOTAL STATE	---	---	---	---	---	---	1 057 270	6 427

FEMA Region 9 — NEVADA — *Potential Fallout*



STATE OF NEVADA -- FALLOUT RISK

Estimated 1985 Population: 938,191
Land Area: 109,895 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	VERY HIGH RISK [GT 15000R] AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	HIGH RISK [EQ/GT 6000R LT 15000R] AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	MEDIUM RISK [EQ/GT 3000R LT 6000R] AREA	LOW RISK [LT 3000R] POPULATION	LOW RISK [LT 3000R] AREA
Churchill							14 479	4 990
Clark					554 764	7 881		
Doublas					21 345	708		
Elko							21 012	17 135
Esmeralda					1 531	3 587		
Eureka							1 342	4 175
Humboldt							11 285	9 698
Lander							4 455	5 515
Lincoln							3 493	10 635
Lyon					16 208	2 007		
Mineral							5 961	3 744
Nye					15 772	18 155		
Pershing							3 587	6 036
Storey					1 877	264		
Washoe							215 966	6 317
White Pine							8 231	8 902
Carson City (Ind)							36 883	146
TOTAL STATE	---	---	---	---	611 497	32 602	326 694	77 293

[MAP WILL BE FURNISHED SEPARATELY]

REGION IX - AMERICAN SOMOA - Potential Fallout

TERRITORY OF AMERICAN SAMOA -- FALLOUT RISK

Estimated 1980 Population: 35,000
Land Area: 77 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Entire Territory	....						35 000	77
TOTAL TERRITORY	---	---	---	---	---	---	35 000	77

[MAP WILL BE FURNISHED SEPARATELY]

REGION IX - GUAM - Potential Fallout

TERRITORY OF GUAM -- FALLOUT RISK

Estimated 1985 Population: 112,900
Land Area: 209 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Entire Territory							112 900	209
TOTAL TERRITORY	---	---	---	---	---	---	112 900	209

[MAP WILL BE FURNISHED SEPARATELY]

REGION IX - AMERICAN TRUST TERRITORY - Potential Fallout

U.S. TRUST TERRITORY -- FALLOUT RISK

Estimated 1980 Population: 116,149
Land Area: 533 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Entire Territory	....						116 149	533
TOTAL Territory	---	---	---	---	---	---	116 149	533

FEMA REGION X -- FALLOUT RISK SUMMARY

Estimated 1985 Population: 8,634,750
Land Area: 815,946 square miles

STATE	VERY HIGH RISK [GT 15000R] POPULATION	VERY HIGH RISK [GT 15000R] AREA	HIGH RISK [EQ?GT 6000R LT 15000R] POPULATION	HIGH RISK [EQ?GT 6000R LT 15000R] AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	MEDIUM RISK [EQ/GT 3000R LT 6000R] AREA	LOW RISK [LT 3000R] POPULATION	LOW RISK [LT 3000R] AREA
Alaska	---	---	---	---	---	---	534 271	570 833
Idaho	---	---	58 634	5 839	526 307	41 482	429 340	35 093
Oregon	---	---	---	---	---	---	2 683 926	96 187
Washington	---	---	581 999	2 548	3 045 577	30 894	774 696	33 070
TOTAL REGION X	---	---	640 633	8 387	3 571 884	72 376	4 422 233	735 183

[MAP WILL BE FURNISHED SEPARATELY]

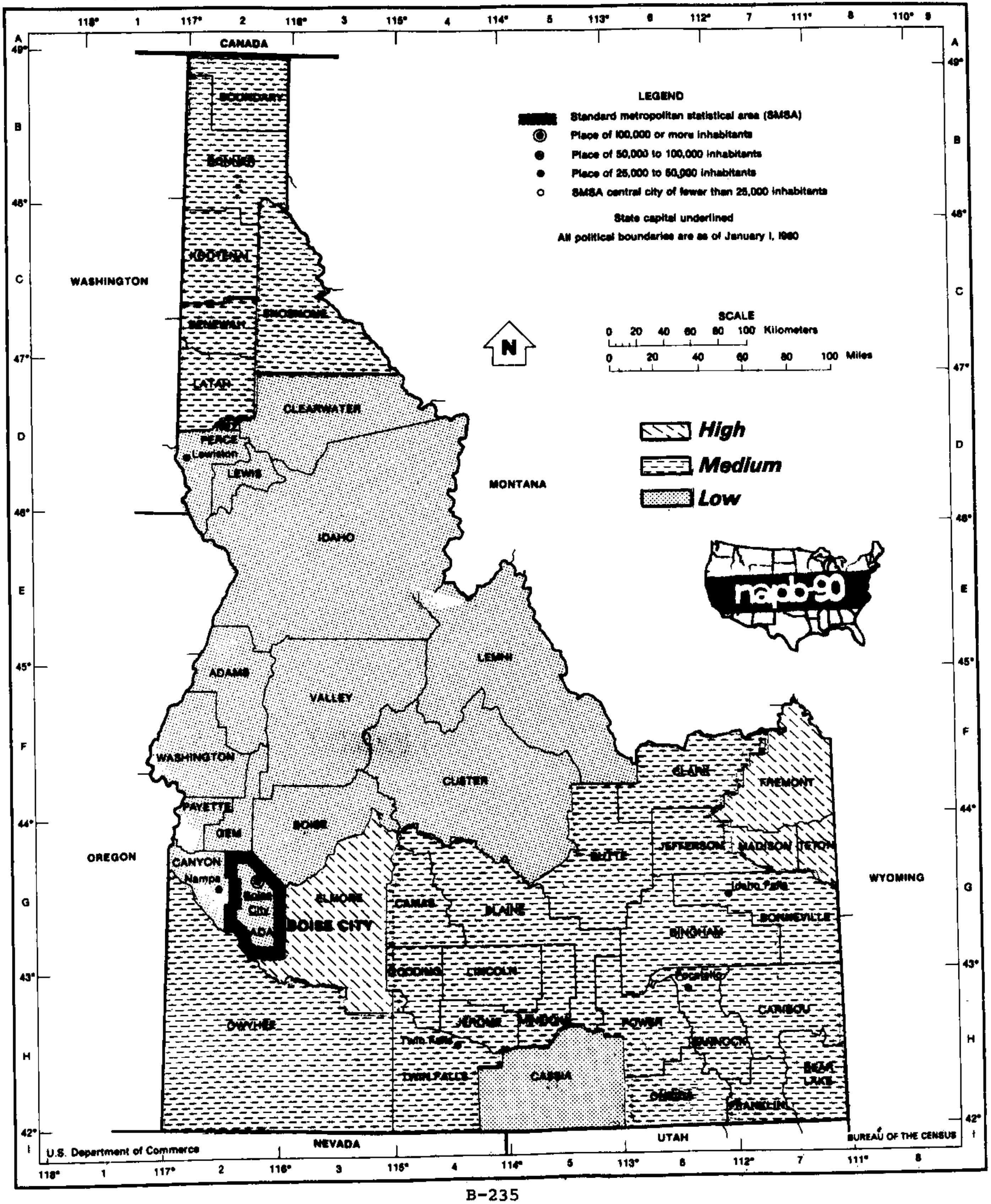
REGION X - ALASKA - Potential Fallout

STATE OF ALASKA -- FALLOUT RISK

Estimated 1985 Population: 534,271
Land Area: 570,833 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Aleutian Islands							7 066	10 890
Anchorage							239 699	1 732
Bethel							12 358	36 104
Bristol Bay							1 142	531
Dillingham							4 988	46 042
Fairbanks North							64 320	7 404
Haines							1 997	2 374
Juneau							24 835	2 626
Kenai Peninsula							43 080	16 056
Ketchikan Gateway							13 381	1 242
Kobuk							5 768	31 593
Kodiak Island							17 229	4 796
Matanuska-Susitn							32 533	24 502
Nome							7 758	23 871
North Slope							5 303	90 955
Prince of Wales							5 077	7 660
Sitka							7 344	2 938
Skagway-Yakutat							4 068	13 239
SE Fairbanks							6 428	24 169
Valdez-Cordova							8 583	39 229
Wade Hampton							5 725	17 816
Wrangell-Petersburg							6 396	5 965
Yukon-Koyukuk							9 193	159 099
TOTAL STATE	---	---	---	---	---	---	534 271	570 833

FEMA Region 10 — IDAHO — *Potential Fallout*



STATE OF IDAHO -- FALLOUT RISK

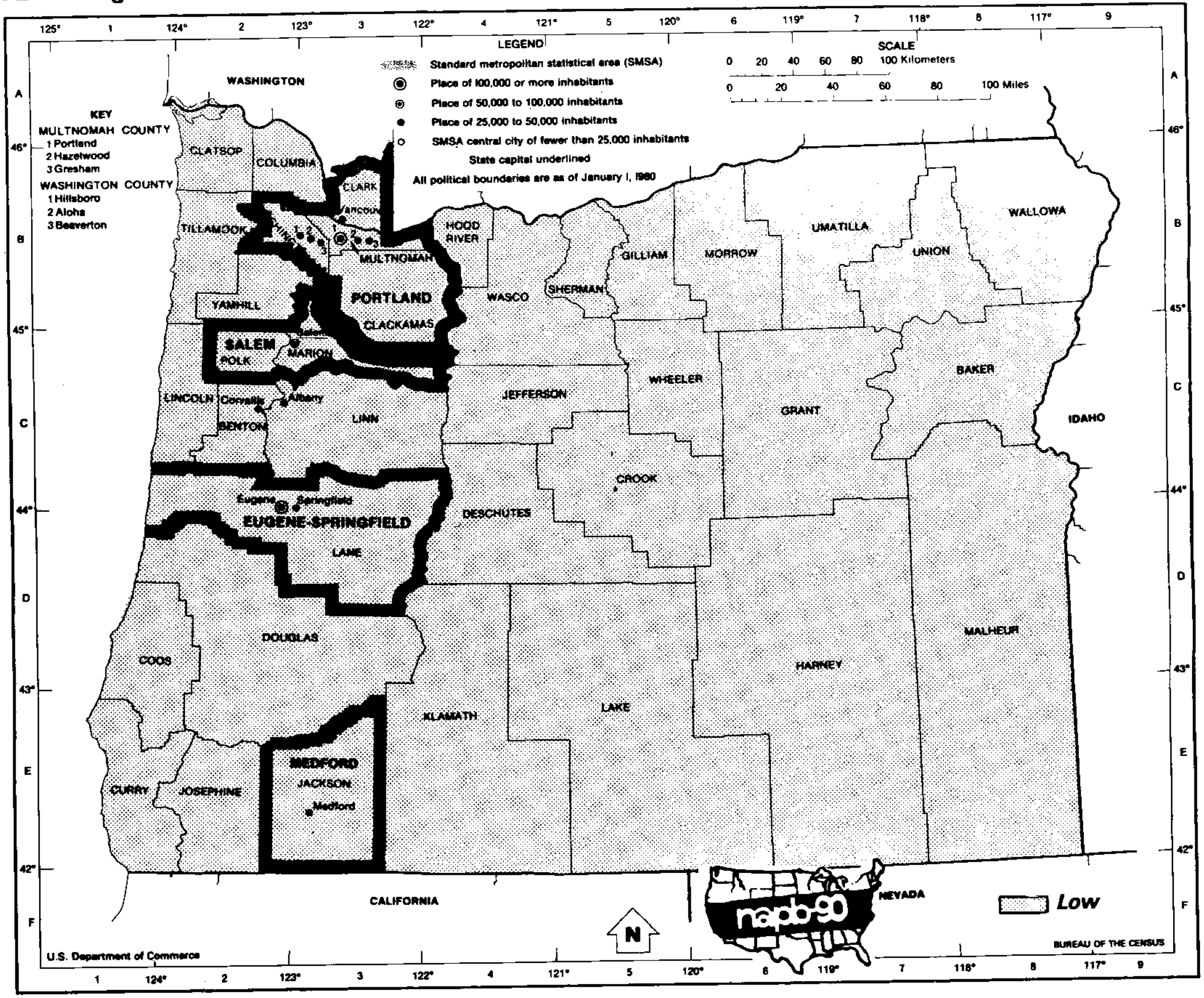
Estimated 1985 Population: 1,014,281
Land Area: 82,414 square miles

COUNTY	VERY HIGH RISK [GT 15000R]		HIGH RISK [EQ/GT 6000R LT 15000R]		MEDIUM RISK [EQ/GT 3000R LT 6000R]		LOW RISK [LT 3000R]	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Ada							193 281	1 052
Adams							3 432	1 362
Bannock					69 355	1 112		
Bear Lake					7 181	990		
Benewah					8 678	784		
Bingham					38 633	2 096		
Blaine					13 418	2 635		
Boise							2 907	1 901
Bonner					26 862	1 727		
Bonneville					69 727	1 840		
Boundary					7 620	1 268		
Butte					3 359	2 236		
Camas					765	1 071		
Canyon							88 722	584
Caribou					8 673	1 763		
Cassia							21 278	2 560
Clark					779	1 763		
Clearwater							10 291	2 236
Custer							6 866	4 927
Elmore			22 234	3 071				
Franklin					9 856	664		
Fremont			10 996	1 852				
Gem							11 460	558
Gooding					12 580	728		
Idaho							14 527	8 497

STATE OF IDAHO (Continued)

COUNTY	VERY HIGH RISK POPULATION	AREA	HIGH RISK POPULATION	AREA	MEDIUM RISK POPULATION	AREA	LOW RISK POPULATION	AREA
Jefferson					16 569	1 093		
Jerome					16 212	601		
Kootenai					67 097	1 240		
Latah					30 625	1 077		
Lemhi							7 891	4 564
Lewis							3 922	478
Lincoln					3 756	1 205		
Madison			22 102	468				
Minidoka					21 531	758		
Nez Perce							33 254	845
Oneida					3 539	1 200		
Owyhee					8 839	7 643		
Payette							15 937	405
Power					6 852	1 403		
Shoshone					16 897	2 641		
Teton			3 302	448				
Twin Falls					56 904	1 944		
Valley							7 000	3 670
Washington							8 572	1 454
TOTAL STATE	---	---	58 634	5 839	526 307	41 482	429 340	35 093

FEMA Region 10 — OREGON — *Potential Fallout*



S T A T E O F O R E G O N - - F A L L O U T R I S K

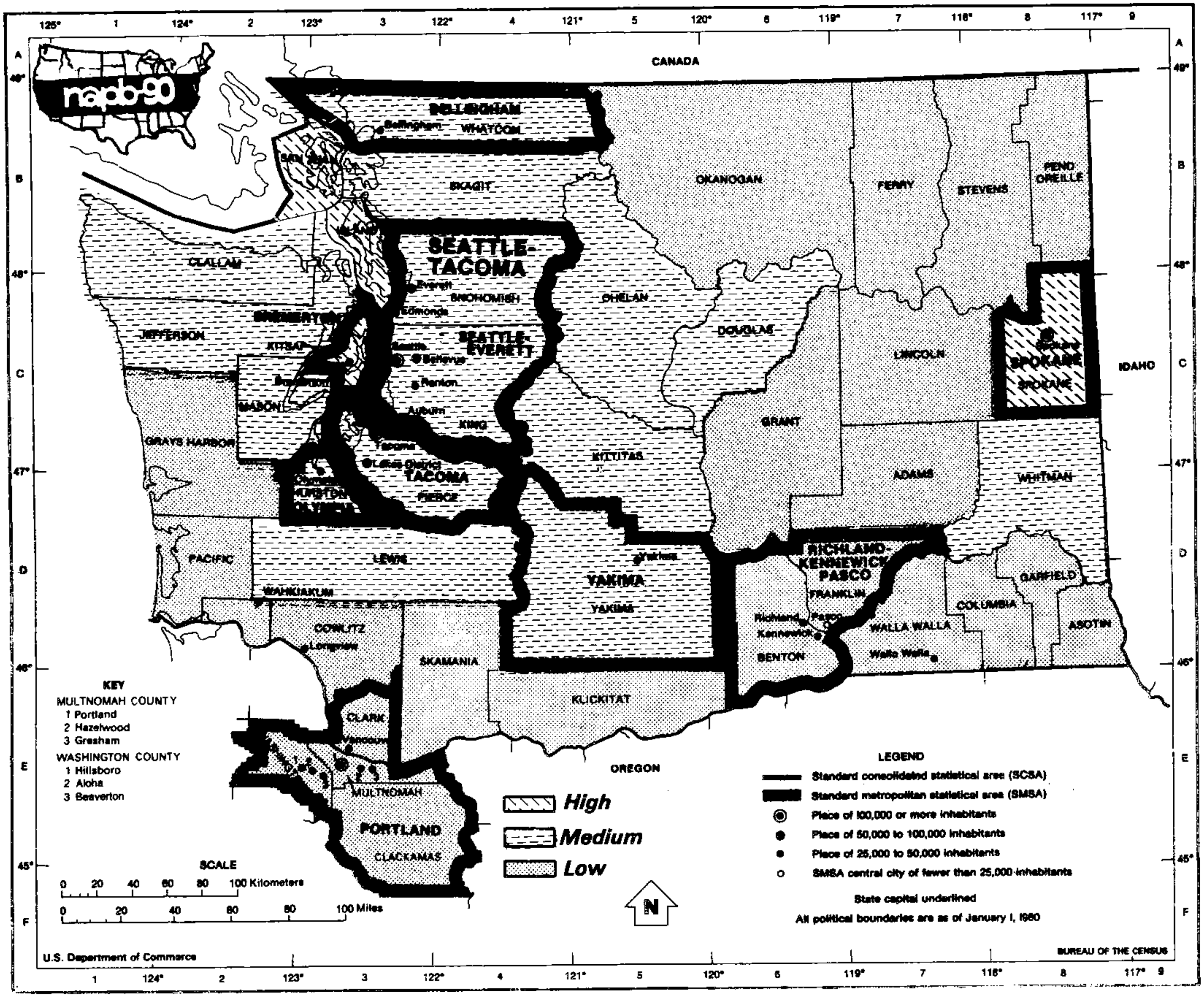
Estimated 1985 Population: 2,683,926
Land Area: 96,187 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	VERY HIGH RISK [GT 15000R] AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	HIGH RISK [EQ/GT 6000R LT 15000R] AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	MEDIUM RISK [EQ/GT 3000R LT 6000R] AREA	LOW RISK [LT 3000R] POPULATION	LOW RISK [LT 3000R] AREA
Baker							16 399	3 072
Benton							65 950	679
Clackamas							255 328	1 870
Clatsop							32 360	805
Columbia							37 060	651
Coos							60 458	1 606
Crook							13 003	2 984
Curry							16 878	1 629
Deschutes							65 782	3 025
Douglas							91 809	5 044
Gilliam							1 883	1 213
Grant							8 231	4 525
Harney							6 989	10 174
Hood River							16 536	521
Jackson							136 961	2 787
Jefferson							12 797	1 789
Josephine							64 672	1 640
Klamath							58 300	5 954
Lake							7 880	8 251
Lane							264 127	4 562
Lincoln							37 132	980
Linn							90 056	2 296
Malheur							29 073	9 861
Marion							211 140	1 184
Morrow							7 813	2 044

STATE OF OREGON (Continued)

COUNTY	VERY HIGH RISK POPULATION	VERY HIGH RISK AREA	HIGH RISK POPULATION	HIGH RISK AREA	MEDIUM RISK POPULATION	MEDIUM RISK AREA	LOW RISK POPULATION	LOW RISK AREA
Multnomah							561 570	431
Polk							45 358	741
Sherman							2 294	827
Tillamook							21 679	1 101
Umatilla							60 893	3 217
Union							24 745	2 036
Wallowa							7 595	3 150
Wasco							22 521	2 385
Washington							268 875	725
Wheeler							1 489	1 713
Yamhill							58 290	715
TOTAL STATE	---	---	---	---	---	---	2 683 926	96 187

FEMA Region 10 — WASHINGTON — *Potential Fallout*



STATE OF WASHINGTON -- FALLOUT RISK

Estimated 1985 Population: 4,402,272
Land Area: 66,512 square miles

COUNTY	VERY HIGH RISK [GT 15000R] POPULATION	AREA	HIGH RISK [EQ/GT 6000R LT 15000R] POPULATION	AREA	MEDIUM RISK [EQ/GT 3000R LT 6000R] POPULATION	AREA	LOW RISK [LT 3000R] POPULATION	AREA
Adams							13 664	1 922
Asotin							17 309	635
Benton							113 359	1 715
Chelan					49 587	2 915		
Clallam					52 381	1 753		
Clark							207 459	627
Columbia							4 031	864
Cowlitz							79 164	1 139
Douglas					24 068	1 817		
Ferry							6 023	2 200
Franklin							36 914	1 243
Garfield							2 567	706
Grant							52 678	2 660
Grays Harbor							64 224	1 918
Island			48 374	212				
Jefferson					17 748	1 805		
King					1 337 360	2 128		
Kitsap			169 172	393				
Kittitas					25 016	2 308		
Klickitat							16 603	1 880
Lewis					57 735	2 409		
Lincoln							9 627	2 310
Mason					35 586	961		
Okanogan							33 037	5 281
Pacific							17 922	908

STATE OF WASHINGTON (Continued)

COUNTY	VERY HIGH RISK		HIGH RISK		MEDIUM RISK		LOW RISK	
	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA	POPULATION	AREA
Pend Oreille							8 902	1 400
Pierce					523 288	1 675		
San Juan			8 901	179				
Skagit					70 097	1 735		
Skamania							7 467	1 672
Snohomish					375 615	2 098		
Spokane			355 552	1 764				
Stevens							31 565	2 468
Thurston					141 832	727		
Wahkiakum							3 681	261
Walla Walla							48 500	1 261
Whatcom					113 087	2 125		
Whitman					41 031	2 151		
Yakima					181 146	4 287		
TOTAL STATE	---	---	581 999	2 548	3 045 577	30 894	774 696	33 070

* U.S. GOVERNMENT PRINTING OFFICE 1987; 719-958/60059